WIRE AND WIRE PRODUCTS

MAY, 1958

-and VAUGHN®

Double

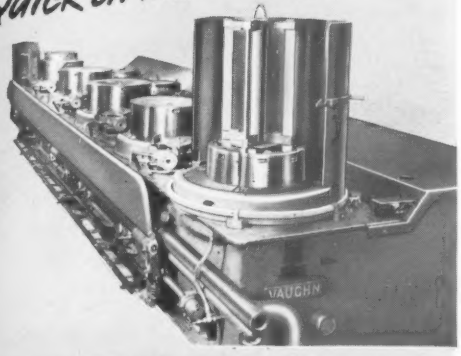
-Cooling

yanked the heat out *FAST*

WITHOUT SOAKING ACTION

Yes, you can run up really big bundles on Vaughn Motoblox—safely, speedily, with the wire in perfect condition thanks to Vaughn Double-Cooling! Air blast and water jets *combined* do a dual cooling job, yanking heat away before the wire is affected. No storage means no heat-soak, either! *Get the facts from Vaughn.*

"Quick on the Draw!"



5/6 HRM Motoblox® with Front Safety Guard and Finishing Block Guard in open position.

THE VAUGHN MACHINERY COMPANY

CUYAHOGA FALLS, OHIO, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT .... Continuous or Single Hole ... for the Largest Bars and Tubes ... for the Smallest Wire ... Ferrous, Non-Ferrous Materials or their Alloys.

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Coulter & McKenzie DRAW-PAK *Equipment*

DRAW-PAK PAYS EXTRA DIVIDENDS

The customer required a take-up for electro-tinned copper wire which would assure *trouble-free* payout to high speed drawing machines. Coulter & McKenzie immediately provided the solution with two Series "500" DRAW-PAK units arranged in banks of six capstans each.

These DRAW-PAK machines not only solved the original payout problem by eliminating frequent breaks and tangles, but they extended the length of the run and yielded *seven additional major improvements* in the product and operation. Look at the extra dividends which the DRAW-PAK paid:

1. **A full number draw is taken during take-up operation.**
2. **Tinning speed increased from 300 to 500 feet per minute.**
3. **Size of take-up package *doubled* — 250 lbs. to 500 lbs.**
4. **Higher degree of tension control assures more uniformity in the electro-tinning process.**
5. **Number of strands per plating tank increased from 4 to 6.**
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7. **25% to 30% increase in efficiency due to longer continuous runs.**

If you want to learn more about how the Coulter & McKenzie DRAW-PAK can help you, write to us today.

Patents Pending

Your satisfaction is our greatest asset.

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THE COULTER & McKENZIE MACHINE CO., INC.

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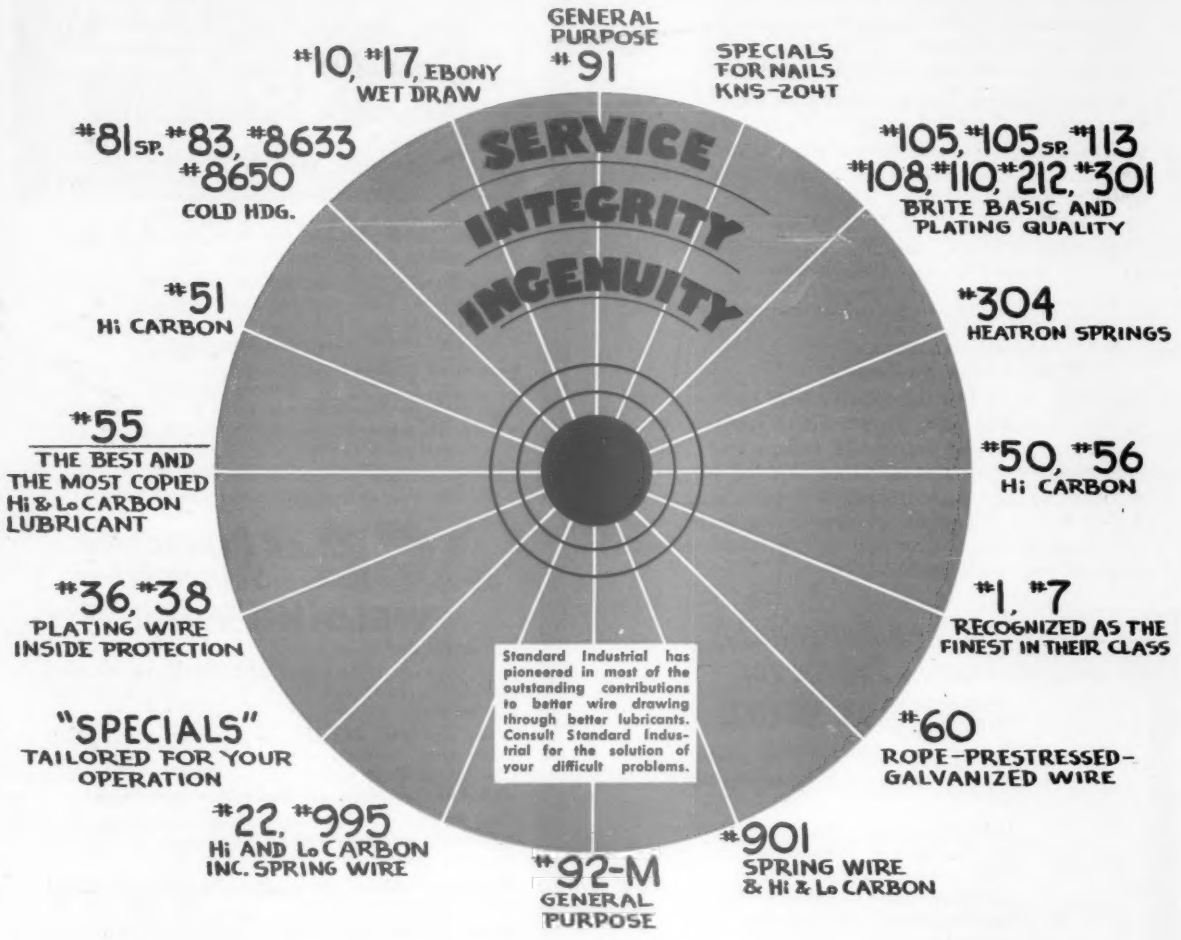
TO "KEEP YOUR SHOW ON THE ROAD" Use

"America's Finest Wire Draw"

We of Standard have concentrated our efforts, since our inception, toward the development of lubricants to solve your drawing problems!


GENERAL PURPOSE #91
#10, #17, EBONY WET DRAW
SPECIALS FOR NAILS KNS-204T
#81 SP. #83, #8633 #8650 COLD HDG.
#105, #105 SP. #113 #108, #110, #212, #301 BRITE BASIC AND PLATING QUALITY
SERVICE
INTEGRITY
INGENUITY
#51 Hi CARBON
#304 HEATRON SPRINGS
#55 THE BEST AND THE MOST COPIED Hi & Lo CARBON LUBRICANT
#50, #56 Hi CARBON
#36, #38 PLATING WIRE INSIDE PROTECTION
#1, #7 RECOGNIZED AS THE FINEST IN THEIR CLASS
Standard Industrial has pioneered in most of the outstanding contributions to better wire drawing through better lubricants. Consult Standard Industrial for the solution of your difficult problems.
"SPECIALS" TAILORED FOR YOUR OPERATION
#60 ROPE-PRESTRESSED-GALVANIZED WIRE
#22, #995 Hi AND Lo CARBON INC. SPRING WIRE
#92-M GENERAL PURPOSE
#901 SPRING WIRE & Hi & Lo CARBON

These are our Prime Business, Not a sideline.

Respectfully yours,

Standard Industrial

COMPOUNDS CO., INC.

FRANKFORT, ILLINOIS

Telephones: 2131-2141

Are You Sure You Are Using the BEST Wire for Your Application?

• If your product involves the use of wire—PAGE asks—"*Can a new wire specification help make your product a better value?*" PAGE has helped many manufacturers to do so and—without increasing their manufacturing cost.

Here at PAGE we are in an ideal position to work with wire users in developing better wire for specific needs. PAGE is a specialty wire mill. Manufacturing wire has been our sole business since 1902.

Our engineering and production staffs regard wire as an important tool which can be designed and made to fill the exact requirements of our customers. Over the years PAGE has maintained a progressive attitude which has pioneered many "**firsts**" in the wire business. Among this list are items such as—

The first adoption of the patenting process in the U.S.
" " to use Tungsten Carbide Dies
" " commercial producer of Aluminized Wire
" " to produce and promote Stainless Steel Strand
" " Woven Wire Fence
" " Stainless Steel Fence
" " All-Aluminum Fence

Above all, PAGE is a dependable wire source. Many of our customers have grown with PAGE for nearly half a century. PAGE experience, talents and facilities are available to you at all times. We will be glad to work with your people in analyzing your wire needs, and if found advisable, in developing a new wire specification which may add to the usefulness and value of your own product.

PAGE - a Dependable Source for GENERAL WIRE

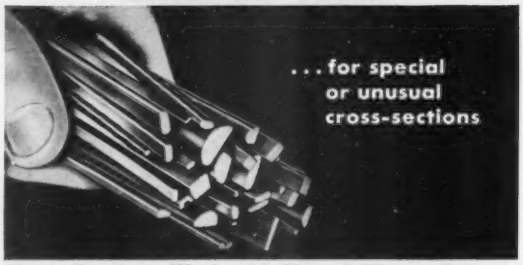
Partial list of PAGE General Wire materials, sections and special purpose wires:

MATERIALS	SECTIONS
Low Carbon	Rounds
High Carbon	Half Rounds
Low Alloy	Ovals... Flats
Stainless Steel	Half Ovals
Armco Ingot Iron	Squares
Aluminized	Special Shapes

SPECIAL PURPOSE WIRES

Aircraft	Signal Corps
Antenna	Spiral Binding
Armature Banding	Spring, Mechanical
Belt Hook	Spring, Upholstery
Broom	Stapling
Buckle	Stitching, Automotive
Button Fastening	Strand
Clip	Telephone
Core (ACSR)	Telegraph
Hairpin	Thermocouple
Lashing	Tire Bead
Lock Washer	Weaving
Safety, Lock	Welding
Shaped (see next column)	(see next column) —and others

PAGE - a Dependable Source for SHAPED WIRE



Many Grades • We furnish Shaped Wire in Low or High Carbon, Aluminized, Low Alloy or Stainless Steel, and in Armco Ingot Iron.

Many Sizes • Cross-section areas to and including .0625 sq. in. Flats and rectangles to 3/8" (width-thickness ratios to 6:1). Also rounds, half rounds, ovals, half ovals, squares, and specials.

Packaged Right • PAGE Shaped Wire—in standard or special coils or in random, exact or multiple lengths, is packaged as you want it: bare bundles, waterproof paper-wrapped, burlapped, boxes, cartons, Leverpaks—palletized on request.

***(SPECIAL NOTE** • We do not stock finished shapes We manufacture to customer specification)*

PAGE - a Dependable Source for WELDING WIRE

33 different analyses for: heavy automatic or light manual submerged arc; inert gas manual; automatic, tungsten or metal arc; oxy-acetylene gas welding.

Wide Analysis Range...*Any carbon* from Armco (.025 max.) to high carbon (.70-.84); all the most popular welding grades of *low alloys;* all standard AISI grades of *stainless.* Other types on request.

Gas Rods...Medium or high carbon steel, mild steel, Armco, low alloy, stainless steel, manganese or naval bronze.

Bare Electrodes...Any carbon from Armco to high carbon (.70-.84).

Metal Spray Wire...Any carbon from Armco to .80 carbon, low alloy, stainless steel, manganese or naval bronze.

BOOKLETS AVAILABLE NOW!

Write us at Monessen, Pa., for informative literature on

☐ Shaped Wire ☐ Welding Wire ☐ Aluminized Wire
☐ Strand ☐ Gas Welding Wire

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

ACCO

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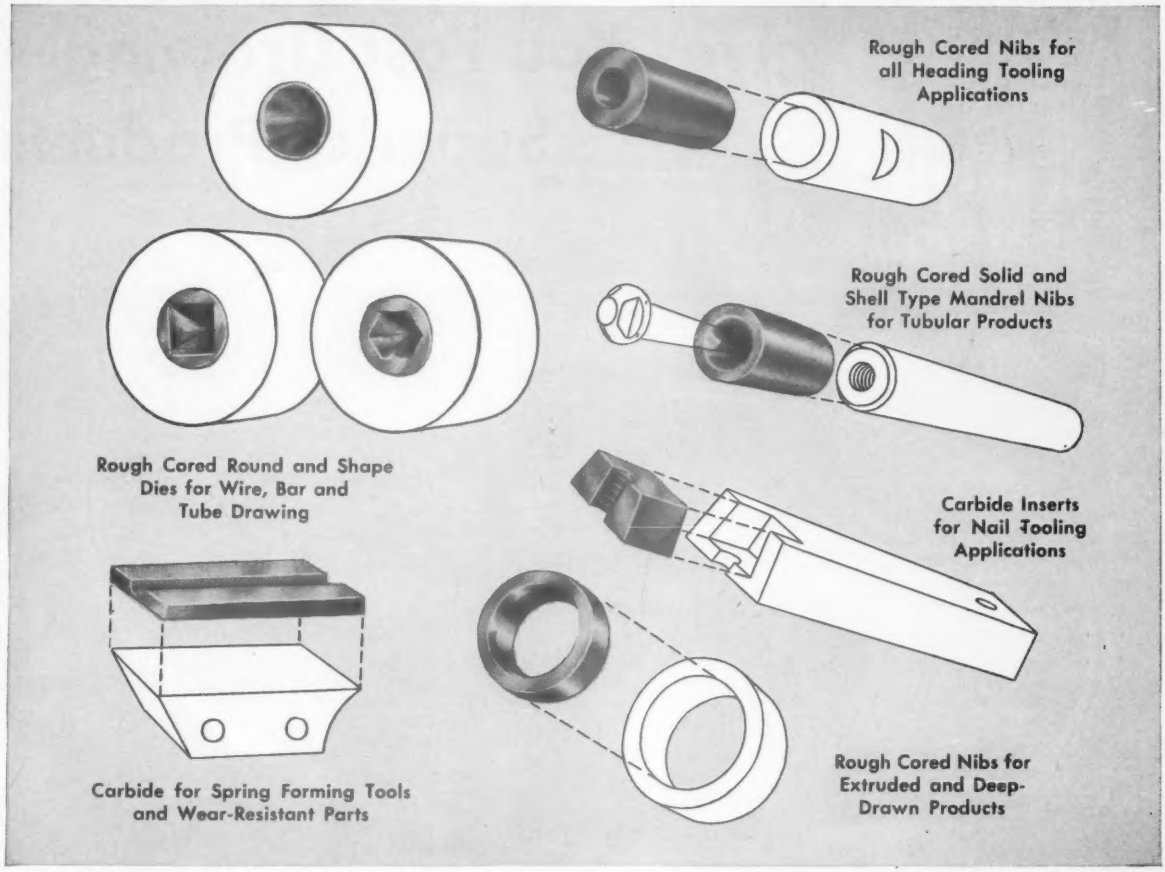
PIONEER IN POWDER AND MOLTEN METALLURGY


Rough Cored Nibs for all Heading Tooling Applications
Rough Cored Solid and Shell Type Mandrel Nibs for Tubular Products
Rough Cored Round and Shape Dies for Wire, Bar and Tube Drawing
Carbide Inserts for Nail Tooling Applications
Carbide for Spring Forming Tools and Wear-Resistant Parts
Rough Cored Nibs for Extruded and Deep-Drawn Products

Specify FIRTHALOY Sintered Carbide for longer wear, better finish, low cost

Standard of quality for 28 years for drawing and forming operations, Firthaloy Sintered Carbide assures maximum performance and increased production.

Leading tool and die makers have adopted Firth Sterling as a preferred source for standard wire, tube and bar dies in a complete range of sizes—as well as a variety of other shapes.

And for close cooperation between your tool and die maker and experienced Firth Sterling engineers—extra "teamwork" that pays off in results—specify FIRTHALOY.

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PRODUCTS OF *Firth Sterling* METALLURGY

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
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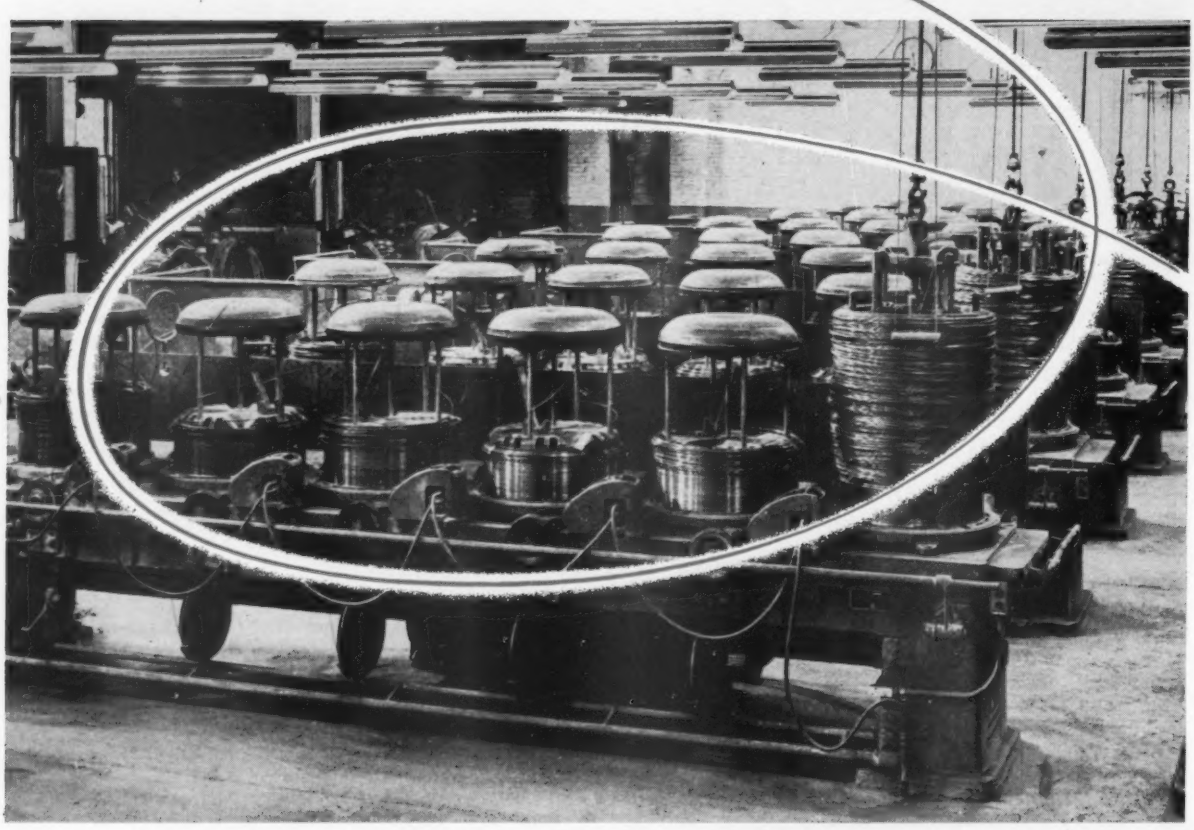
FIRTH STERLING TRADE MARK

MORGAN-CONNOR
AIR COOLING
gives You Fast Drawing— Superior Products



A battery of Morgan-Connor Machines in operation. Note the minimum space required for each machine.

Morgan-Connor Wire Machines use an exclusive air-cooling method to keep the wire really cool.

Results — a superior product!

WM-103

MORGAN CONSTRUCTION COMPANY • WORCESTER, MASS.

WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 33 May, 1958 No. 5

Designated as Official Publication By The Wire Association

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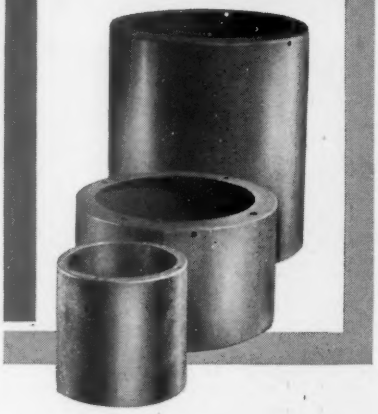
REPUBLIC MAKES OVER 100 SIZES OF

Flanged Steel Traverses



Republic offers one of industry's largest selections of Flanged Steel Traverses. Sizes range from 12″ to 56″ in diameter and from 6″ to 48″ in length. Finishes include plain, painted and hot dipped galvanized. Width of flange and number of bolt and drain holes can be furnished to your specifications.

Republic "Reinforced Type" Steel Traverses have extra strength where it is needed most—at bolt holes and base of flange. Reinforcing permits use of lighter gage steel. Saves up to 20% in weight while increasing over-all strength. Send coupon for more information.

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Send more information on Flanged Steel Traverses.

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Company_____

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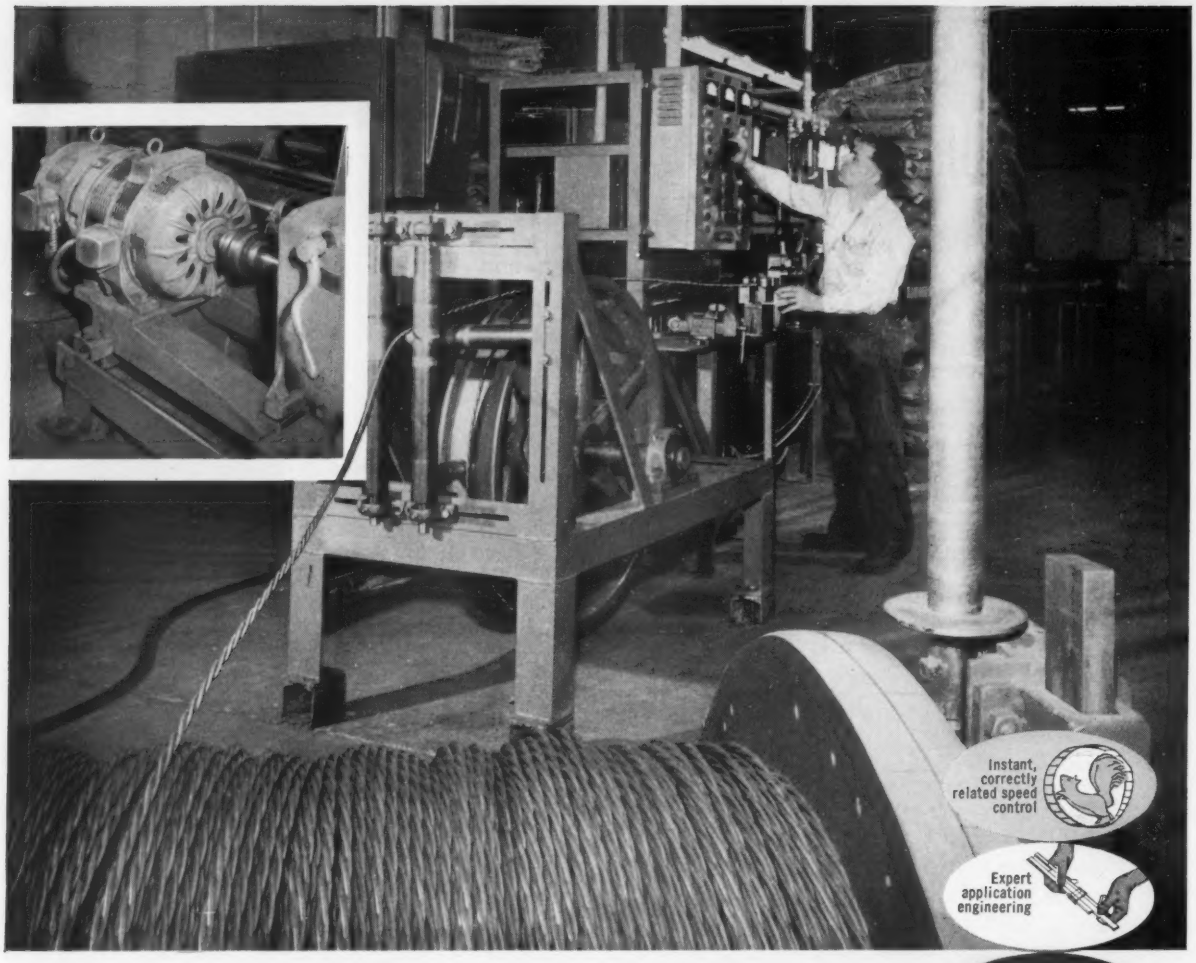

Insulate every foot of cable uniformly and at less cost

Louis Allis Ajusto-Spede® AC drive automatically synchronizes speed of wire and flow of insulant in extrusion process

There is a *proven* way to increase output and to slash costs in the production of insulated wire cable. The solution: provide precise electrical adjustable speed control for your wire lines by using Louis Allis Ajusto-Spede AC drives in your extrusion process.

This remarkable drive automatically synchronizes the speed of the capstan, extruder, and take-up. It assures proper tension on the wire at all times—cuts rejects to the bone because every foot of cable is insulated with the exact amount of insulant that customers specify.

Ajusto-Spede gives you "one-dial" master speed control — converts your process into a smooth, cost-cutting operation. Now there's no need to change mechanical setup to insulate wires of varying sizes. You merely change the speed settings.

If your operation is too costly, it's time to ask your local Louis Allis sales engineer for help. He can draw upon long engineering experience and a complete line of adjustable speed drives to put your wire line on a more profitable basis.

Ajusto-Spede drives are available in sizes from 1 to 75 hp, with adjustable speed from 0 to 3400 fpm. What's more, you have a choice of mechanical and/or electrical modifications for every need.

For information, contact a nearby Louis Allis District Office. Or write The Louis Allis Co., 451 East Stewart Street, Milwaukee 1, Wisconsin.

ASD-112

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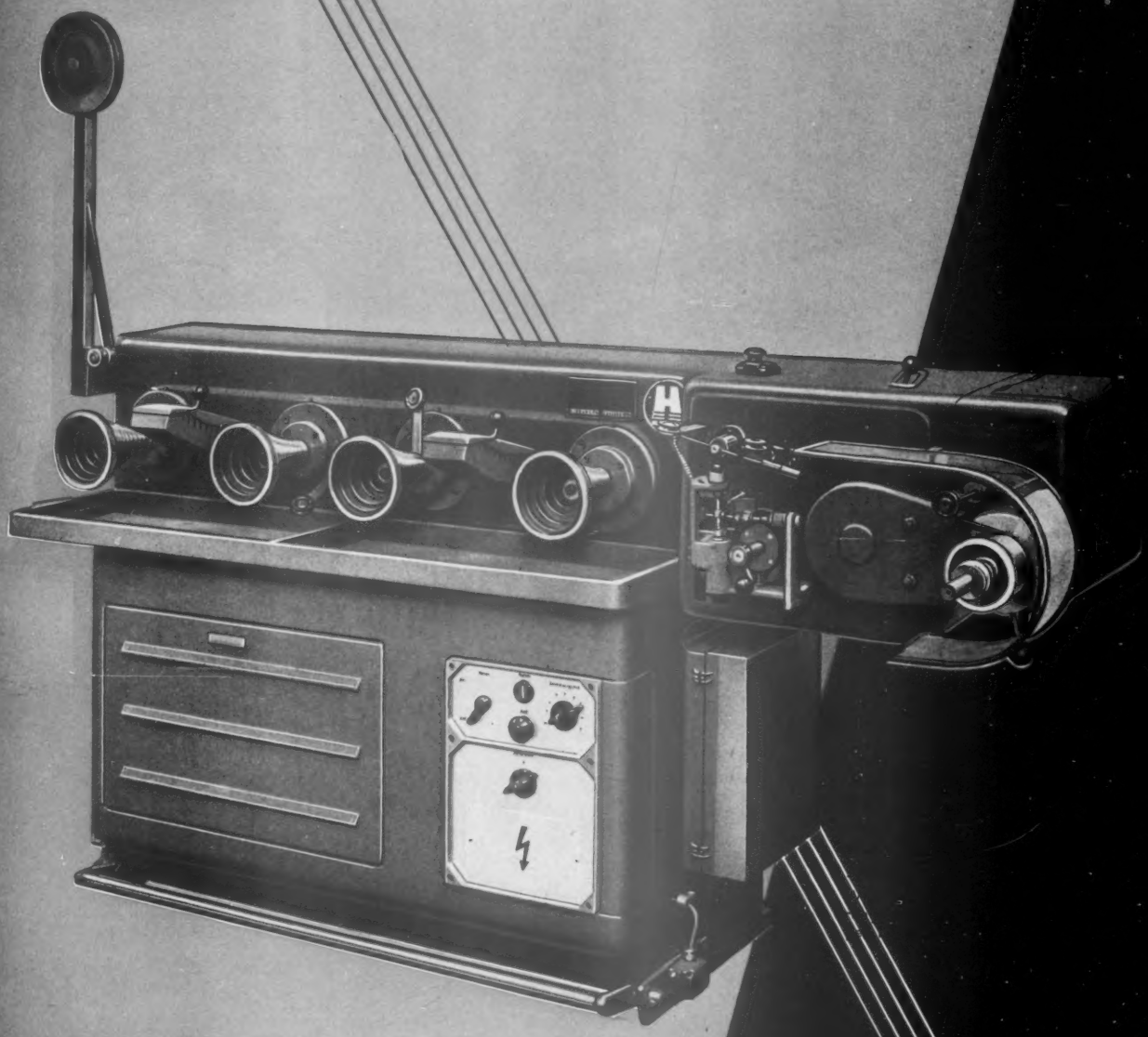
MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

HERBORN

Drawing Machines for ultra fin



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NOW CF&I WIRE . . .

clean . . . convenient . . . compact . . . cuts costs

This new, revolutionary method of packaging keeps CF&I Wire free of rust and dust from the last pass on the drawing frame, through shipping and storage, until the sealed fibre drum is opened at your wireforming machines.

Each 600-lb. capacity fibre drum holds from five to eighteen miles of CF&I wire in *one continuous length*. It provides these cost saving advantages: • **Increased production (fewer set-ups)** • **Wire will not snag or kink** **Simplified storage (stack them)** • **Easier inventory control (count them)** • **Can be palletized for easy handling** • **Less scrap loss (no coil ends).**

Whatever your packaging requirements, or whatever your specifications for steel wire may be, check with CF&I. Our newly modernized and enlarged plants can provide fast delivery on high or low carbon steel wire . . . round, flat or shaped . . . in a wide variety of sizes, tempers, grades and finishes . . . in small quantities, carload or mixed carload lots.

WHEN YOU NEED WIRE . . . MAKE

IN FIBRE DRUMS

Here is a partial list of the many types of carbon steel wire manufactured by CF&I:

GRADES

low carbon
medium high carbon
high carbon
round
square
flat
shaped

FINISHES

bright dry drawn or lime bright
bright grease drawn
cadmium coated
coppered
extra clean smooth bright
galvanized
liquor
white liquor
tinned

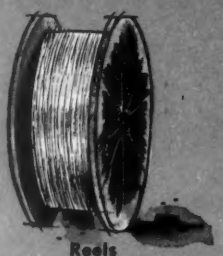
STANDARD TYPES (partial list)

aircraft cord
bee
bobbin ring
bobby pin
bookbinder
broom
brush
casing
clip
concrete reinforcing
cotter pin
curtain spring
die spring
fine & weaving
fuse
Gamma spring
garment hanger
glass netting
hair pin
hat
hose, reinforcement
hose, mechanical
hose, vacuum
lock spring
lockwasher
manufacturers' drawn
mattress
merchant
nail
oil tempered
picker tooth
picture cord
pin ticket
regulator
rope
safety pin
screen
shaft, flexible
Signal Corps
snake fishing
spiral binding
spring
stapling
staple
stone
tie
twisted & laid
upholstery
valve spring
weaving
welding
Wissco Iron

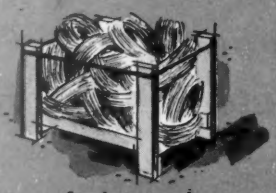
Other CF&I standard packaging methods

Steel-strapped coils (200- 2000 lbs.)

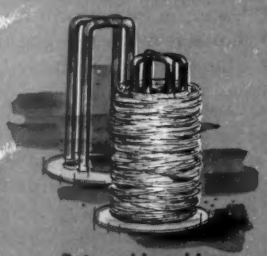
Non-returnable spiders (500-700 lbs. capacity)



Reels (500-800 lbs. capacity)



Steel-strapped wooden rack



Returnable spiders (2000-4000 lbs. capacity)

CF&I-WICKWIRE WIRE

THE COLORADO FUEL & IRON CORPORATION

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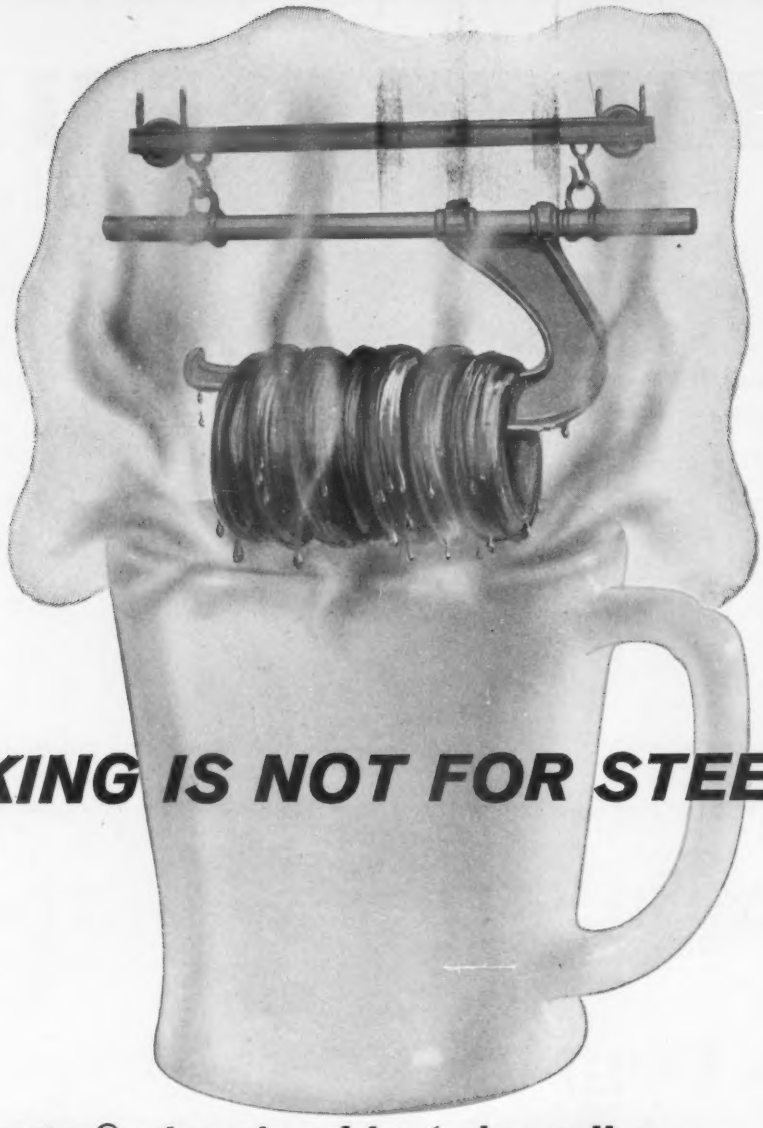
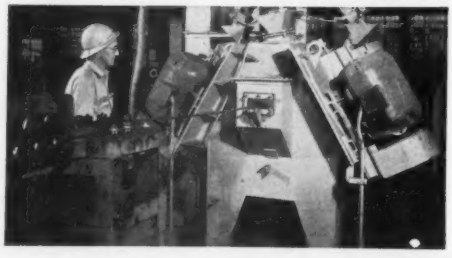


DUNKING IS NOT FOR STEEL ROD

Wheelabrator® abrasive blast descaling automates wire drawing and processing lines

Through application of Wheelabrator blast descaling, it is now possible to clean, coat, draw, and cold head in one continuous operation and secure the following advantages:

- **Strand cleaning and coating ahead of cold drawing**
- **Faster, more uniform cleaning**
- **Superior finish for coating and die lubrication**
- **Elimination of multiple handling of hot rolled coils**



These cost-cutting Wheelabrator advantages are already being obtained by prominent producers of wire products in descaling various size rod at speeds up to 600 f.p.m. New applications in the wire products field are constantly being developed. It will pay you to investigate the Wheelabrator for your cleaning problems. Write today for complete information.

Send for Bulletin No. 148-D

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CORPORATION

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Canadian Offices: Scarborough (Toronto) – Montreal

Profitable Preview of the

Syncro*— Geoffroy-Delore Continuous Coiler

Soon, we will make available the Syncro — Geoffroy-Delore Continuous Coiler. This machine is a bold, yet simple solution to a familiar problem in wire plants the world over. Its operational efficiency is such that it cannot fail to materially increase your production and to cut costs.

Although it is not quite time for your order-taking, we want to alert you to watch for this addition to Syncro's line of wire mill machinery. Keep your eye on Syncro for **Wiremanship, Cablemanship . . . Leadership**

*Exclusive U.S. Manufacturing licensee.

SYNCRO MACHINE COMPANY
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affiliated company: WINGET SYNCRO Ltd. Rochester Kent, England

Better Machinery for the Wire Industry

SYNCRO®

WIRE DRAWING MACHINES • DIE STRINGERS • CONTINUOUS ELECTRIC ANNEALERS • PAYOFFS • CAPSTANS • WIRE INSULATORS • HEAVY DUTY TAKEUPS • TAPERS • SPECIAL MACHINERY

HOT TIP
FOR COAXIAL CABLE

RF cable manufactured with Monsanto Polyethylene 12253 meets Mil-C-17B specifications

MONSANTO

Even if you're not producing coaxial cable for military purposes, the development of Monsanto Polyethylene 12253 can have immediate value, since polyethylene used in Mil-C-17B constructions must meet requirements* as rigid as any critical-use cable application.

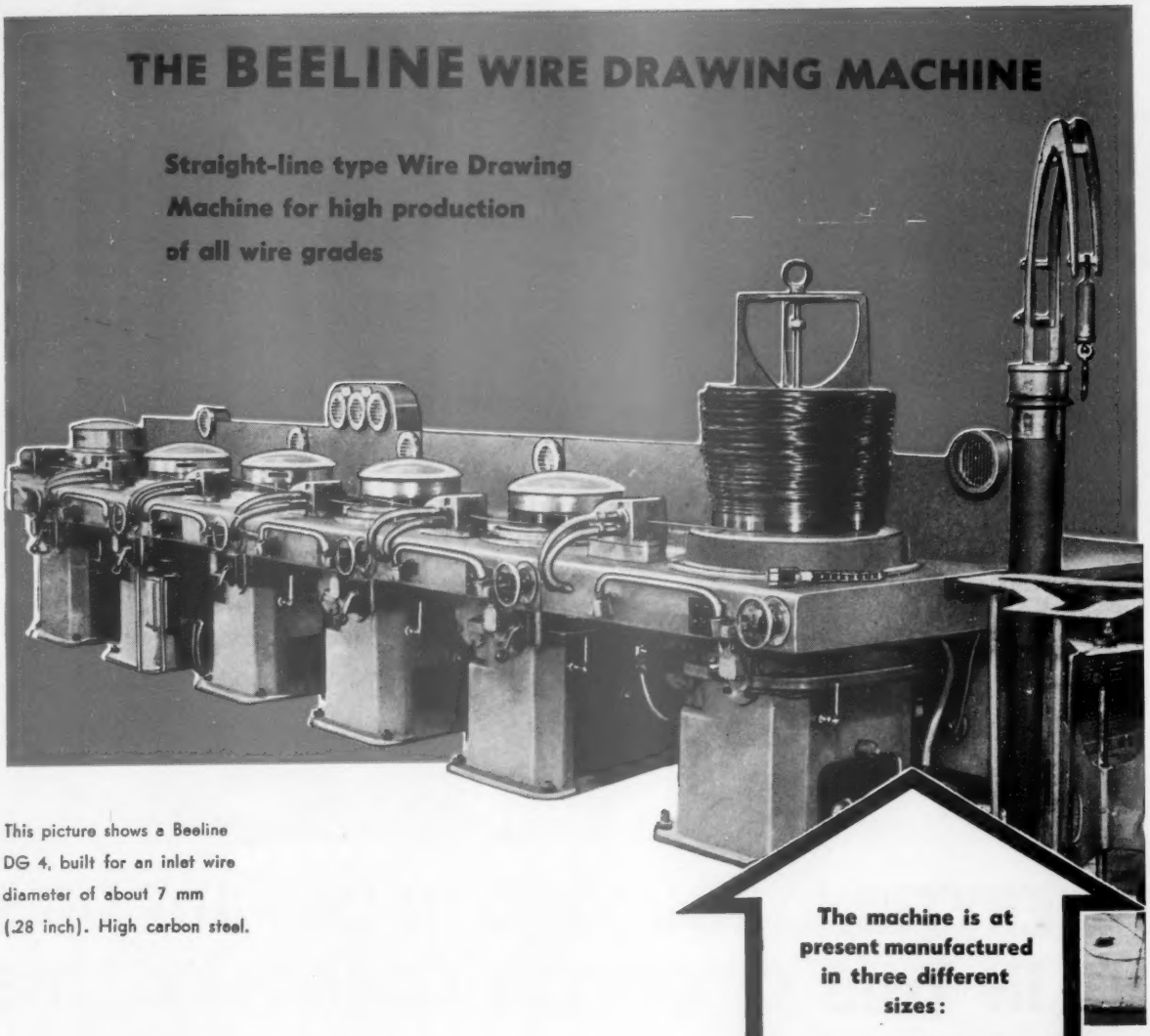
Monsanto Polyethylene 12253—with its low loss at high frequencies, low dissipation factor, high dielectric strength, flexibility over a wide temperature range, and mechanical strength—readily qualifies as your single, inventory-simplifying, critical-use polyethylene—a non-staining compound for coaxial cable, primary telephone insulation, or power cable.

12253 is one of an expanding series of insulating and jacketing compounds that are products of Monsanto's specialized research on electrical grade polyethylene resins. Write for the complete technical data, to Monsanto Chemical Company, Plastics Division, Room 542 Springfield 2, Massachusetts.

*Mil-D-3054A specifications for insulating compounds used in Mil-C-17B Coaxial Cable.

THE BEELINE WIRE DRAWING MACHINE

Straight-line type Wire Drawing Machine for high production of all wire grades



This picture shows a Beeline DG 4, built for an inlet wire diameter of about 7 mm (.28 inch). High carbon steel.

Prominent Beeline features:

- Complete absence of slipping between wire and block.
- Direct block-to-block wire running, with automatic speed control and no loops or other mechanical adjusting devices.
- Continuous speed adjustment from almost zero up to maximum.

Let us help you solve your problems. We shall be glad to answer your questions promptly. Don't forget to let us know what wire is to be drawn, the inlet and finished diameter, its intended use, the production required, and all other relevant information (tensile strength of the finished wire etc.). Then we can suggest a machine that is just right for you.

The machine is at present manufactured in three different sizes:

BEELINE DG 5

for heavy wire, about 13 mm. (.500 inch)

BEELINE DG 4

for wire rods, about 7 mm. (.28 inch)

BEELINE DM 3

for wire with an inlet dia: wire of about 3 mm. (.116 inch)

MORGÅRDSHAMMAR

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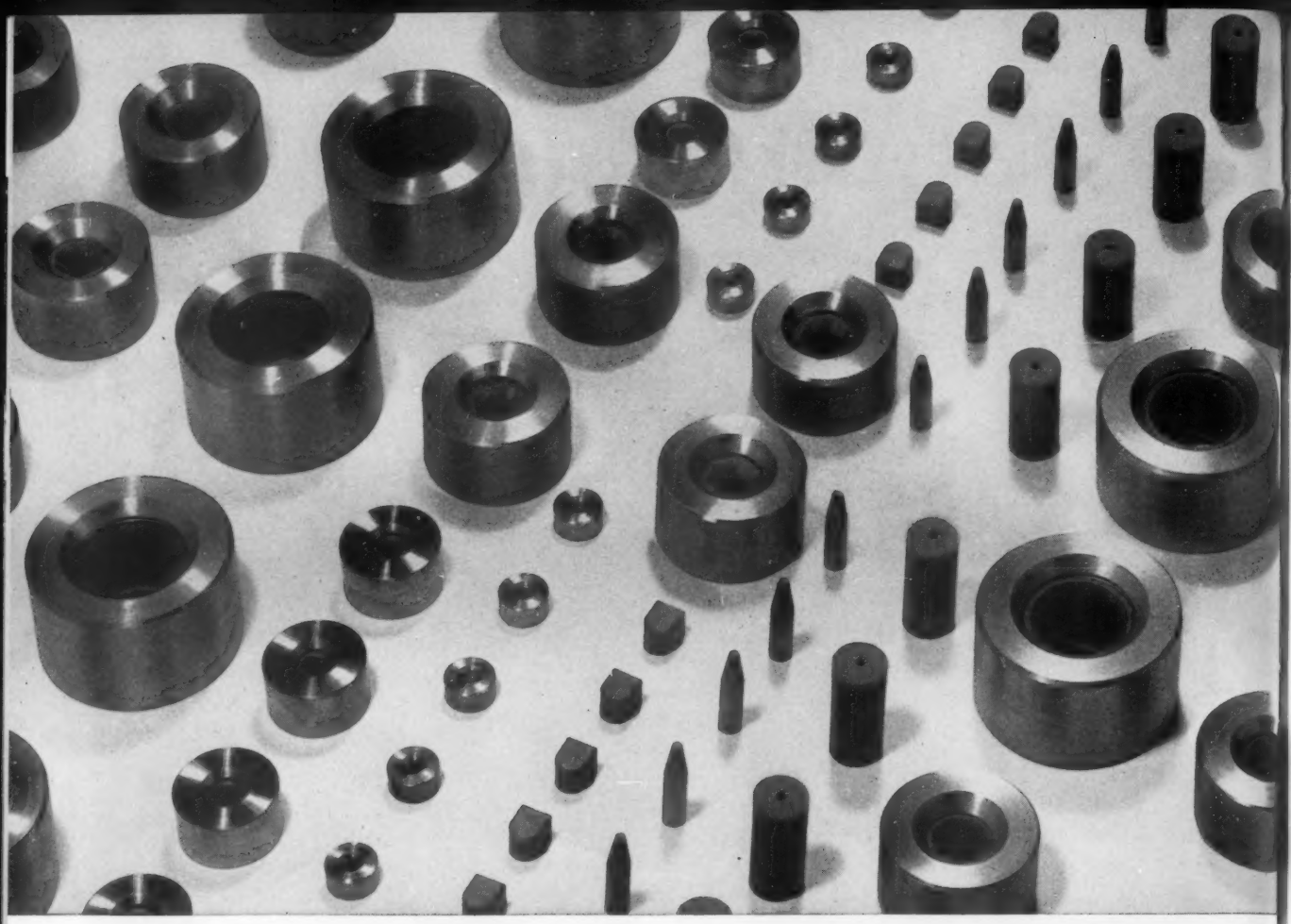

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Whether you're working with wire, bar, or tubing . . . whether you're drawing, extruding, heading or flattening . . . there's a Carboloy carbide product to do the job.

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With this complete line of Carboloy cemented carbide die products you get top tonnage . . . plus expert technical assistance from carbide specialists. For more information, or your copy of the new Carboloy Die Engineering Manual D-140, write: *Metallurgical Products Department of General Electric Company, 11171 E. 8 Mile Blvd., Detroit 32, Michigan.*

CARBOLOY®
CEMENTED CARBIDES

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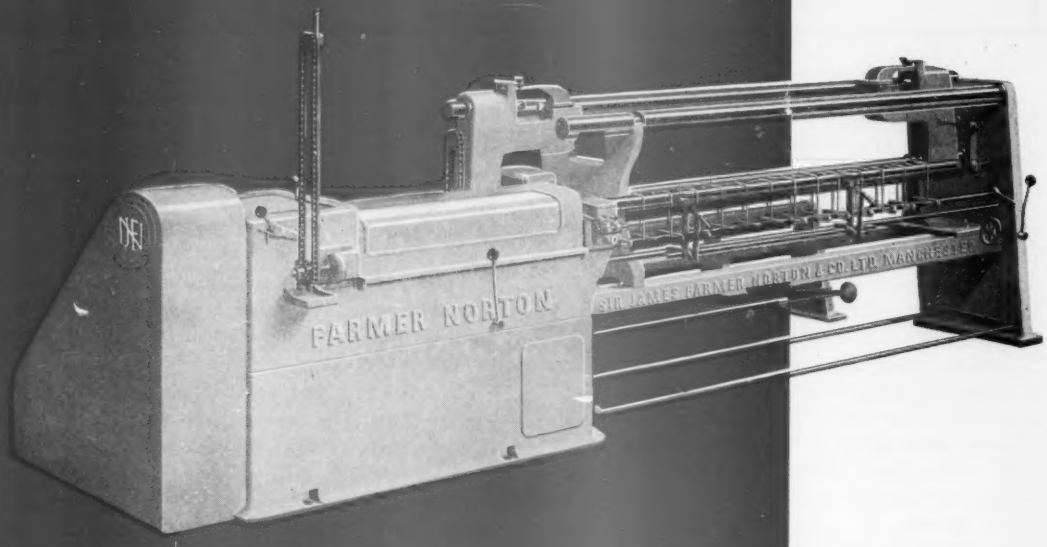

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MARK 1. Width up to 7 foot maximum fence.

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Capacity from 6's to 14's gauge wire in 1¼" to 4" meshes.

Practical output on suitable wire: 2" mesh on 4 foot netting height up to 1750 square feet per hour.

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MAKERS OF WIRE DRAWING, WEAVING MACHINES AND ACCESSORIES

U.S.I.

Vol. II, No. 5

POLYETHYLENE PROCESSING TIPS

HOW CARBON BLACK QUALITY AFFECTS WEATHER RESISTANCE OF POLYETHYLENE

For cable jacketing and many other outdoor applications polyethylene offers substantial advantages over other materials. It is subject, however, to degradation from long exposure to sunlight unless the resin is properly protected.

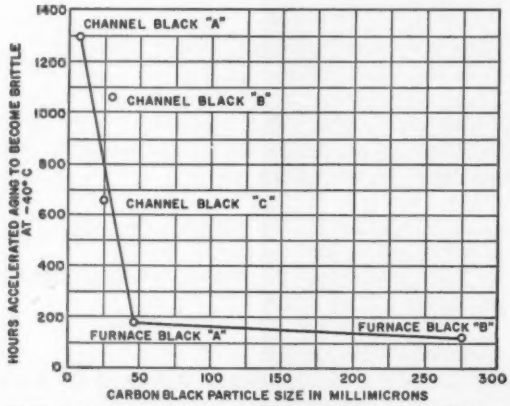
Actually, the aging of polyethylene is the result of a chemical reaction with atmospheric oxygen. Catalyzed by the ultraviolet rays in sunlight, this reaction proceeds more rapidly in outdoor use than is the case with indoor applications. The principal effects of aging are to increase brittleness at low temperature, and to decrease the resistance to stress cracking.

Carbon black dispersed throughout the polyethylene greatly retards this aging, or weathering. However, not all carbon blacks produce the same degree of weather resistance when dispersed in polyethylene. Moreover, the care with which the carbon black is dispersed in the polyethylene is vitally important.

The weather resistance of a polyethylene compound depends on: (1) type and particle size of carbon black; (2) percentage of carbon black in the compound; (3) the dispersion of the carbon black in the polyethylene.

Accelerated aging tests have been devised to approximate the action of years of outdoor exposure.

The graph below shows the great difference in number of hours required in these tests for a polyethylene to embrittle at −40°C when various carbon blacks having different particle sizes are used.



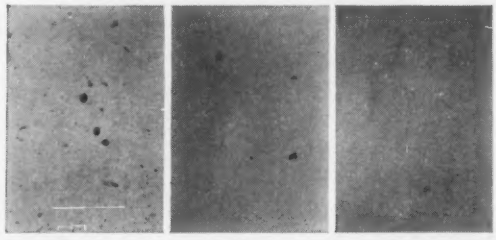
EFFECT OF CARBON BLACK PARTICLE SIZE ON ACCELERATED AGING OF POLYETHYLENE.

The two at right are "furnace blacks", and it will be noted that they are comparatively ineffective. The three at the left are "channel blacks", and obviously, they are many times more effective. This is due to their much smaller particle size — from about 10 to 25 millimicrons, against 50 to 275 millimicrons for furnace blacks.

Weather resistance also increases with the concentration of carbon-black — up to a point. Beyond this point the light screening effect is offset by a decline in other properties.

DEGREE OF DISPERSION IMPORTANT

Carbon black gives maximum protection only when it is thoroughly dispersed in the polyethylene. This presents a difficulty because the smaller the particles, the greater is their tendency to collect into clusters which, once formed, are hard to break up. Tests show that a good dispersion will withstand 15 to 20 times as much exposure to sunlight as a poor dispersion.



POOR FAIR GOOD

MICROPHOTOGRAPHS OF CARBON BLACK DISPERSIONS IN POLYETHYLENE.

The wire and cable grades of U.S.I.'s PETROTHENE polyethylene resins employ only the finest "channel black" carbon black. Concentration is set at a point which yields the optimum balance of light screening and other properties. Special processing equipment insures thorough dispersion. The result is black polyethylene that withstands long, severe outdoor exposure, yet affords the practical maximum of tensile and other properties.

If you fabricate or use black polyethylene, ask U.S.I. for complete technical data on PETROTHENE resins expressly formulated for weather resistance.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

SCREW CORPORATION reports KEYSTONE XL meets rigid aircraft industry standards

Here's Keystone "XL" *flowability* in action. Extremely close tolerances were required for this Phillips head sealing screw. The uniform head for flush mounting and the accurately formed groove to hold the sealing ring must be precise.

A difficult Phillips recess—a small #6 round head with a #2 Phillips recess. The head diameter is out of proportion to recess diameter—a production reality when Keystone "XL" Wire is used.

Keystone "XL" Wire's *flowability* allows straight sides and sharp corners in heading of this Fillister head screw. Shaving operation was eliminated.

KEYSTONE XL WIRE STUDY

flowability IS THE SECRET

How important can a fastener be? Ask the folks at Screw Corporation. They'll tell you that all fasteners used by the aircraft industry must be perfectly formed.

Screw Corporation serves 200 aircraft customers from their headquarters at 157 N. Rivergrade Road, City of Industry (Los Angeles).

For one major aircraft manufacturer, Screw Corporation has produced fasteners by the millions—all made from Keystone "XL" Wire . . . *flowability* is the secret and the reason why Keystone "XL" Wire is the preferred cold heading wire. See your Keystone Wire specialist soon or write direct.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

This fastener is the base for one of the newer developments in electronics—the transistor. Screw Corporation reported this to be a difficult forming job—but the problem was solved with Keystone "XL" Wire.

These fasteners are magnetically inspected to insure no fractures before assembly. Keystone "XL" Wire passes this test daily on these flush fasteners which, with "O" rings, seal aircraft interiors so they can be pressurized.

Keystone Steel & Wire Company
Peoria 7, Illinois

Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

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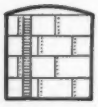
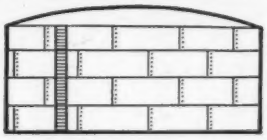
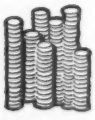
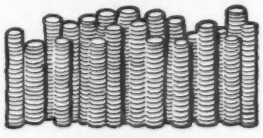
WANT TO CUT PICKLING COSTS?

YOU CAN WITH ACP RODINE

Even though you are now using an inhibitor in your pickling bath, highly concentrated ACP RODINE can cut pickling costs. Savings in acid, steel and money, as shown in the chart, are based on: a monthly steel production of 15,000 tons; a selling price of $140.00 a ton; and an acid cost of $ .01 a pound.

ACID SAVED	3 lb. per ton	 45,000 lb. per month	 540,000 lb. per year
STEEL SAVED	1½ lb. per ton	22,500 lb. per month	270,000 lb. per year
DOLLARS SAVED	$.135 per ton	 $2,025.00 per month	 $24,300.00 per year

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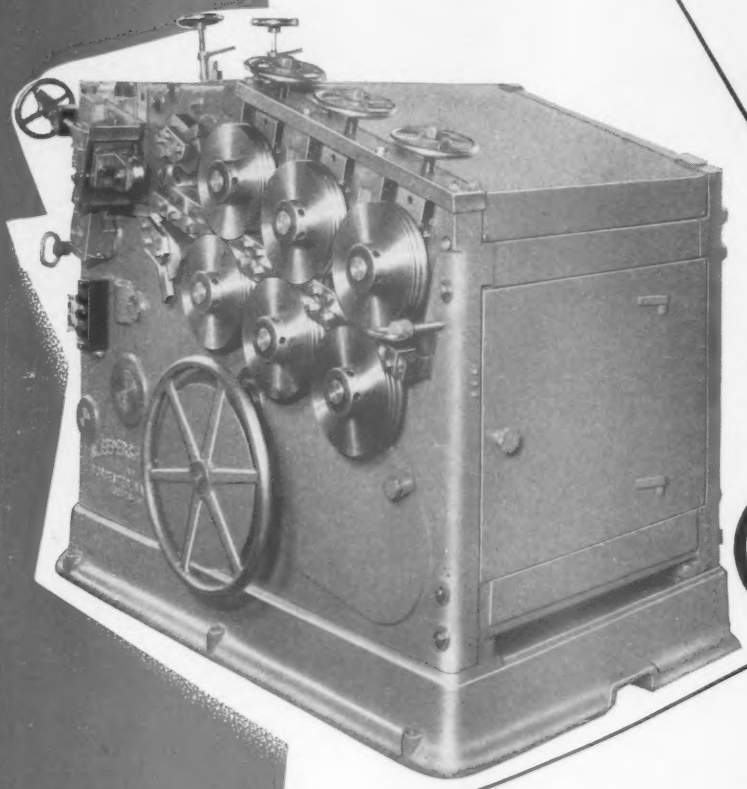

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- Coils wire up to ½" in diameter
- 12" rolls push more wire through machine
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- Reverse motor control to eject end of wire
- Power coil starting and trimming
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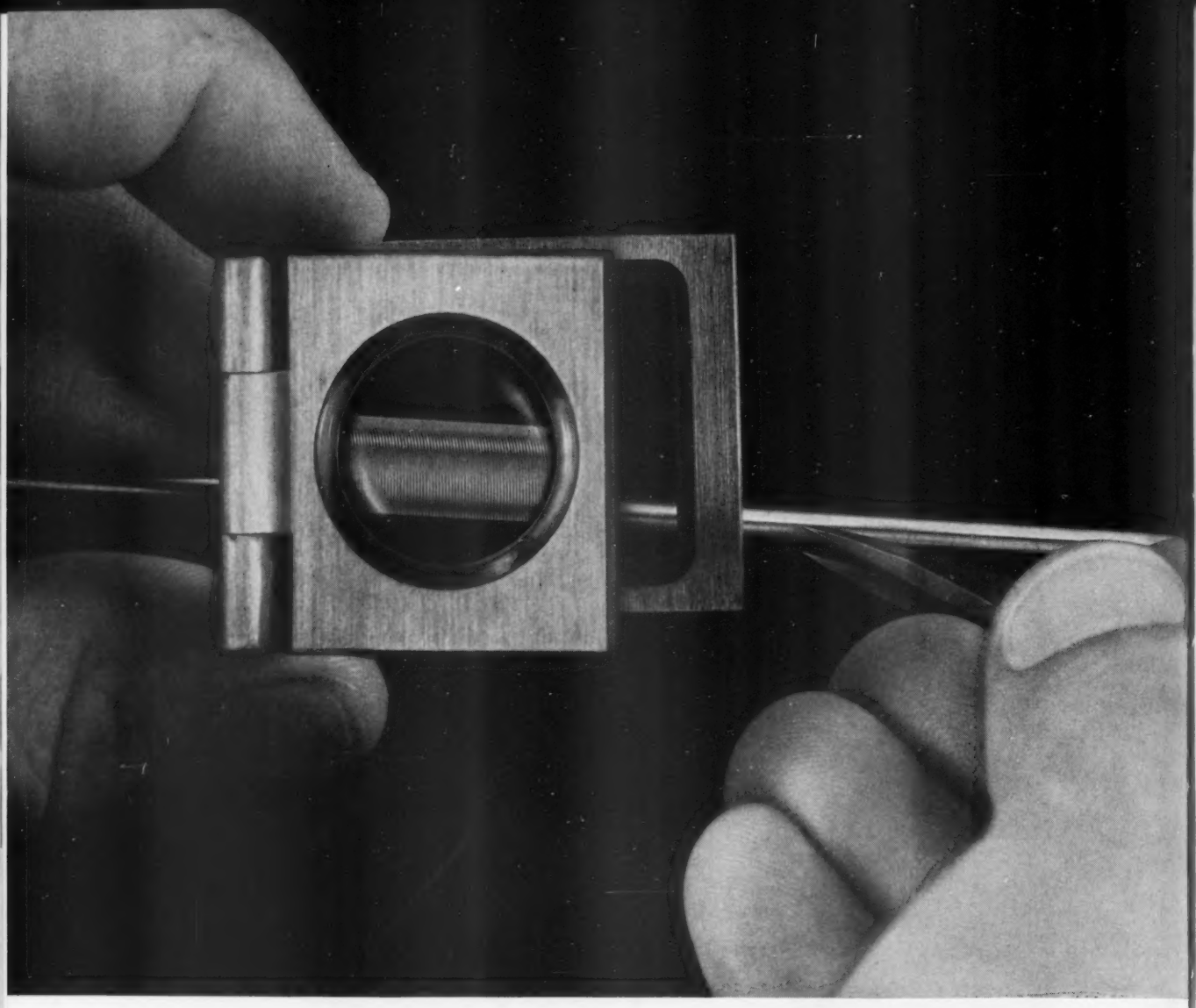


How "high fidelity" in music spring wire licks a big production problem

Leading producers of carbon paper apply the carbon coating by means of steel rods closely wound with hair-fine music wire. The wire-to-wire valleys, as determined by wire diameter, control the amount of carbon deposited.

Here is a case where product quality and smooth, uninterrupted production are both dependent on extreme uniformity in the fine wire being used—extreme uniformity in diameter, finish and temper.

This super-critical wire is produced by the Worcester Wire Works Division of National-Standard. Because it does the best job by production comparison, it's naturally preferred. Keep this in mind and check with the Worcester Wire Works Division on your next need for fine wire if quality control is at all a factor. You'll get the finest of *service*, too!

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

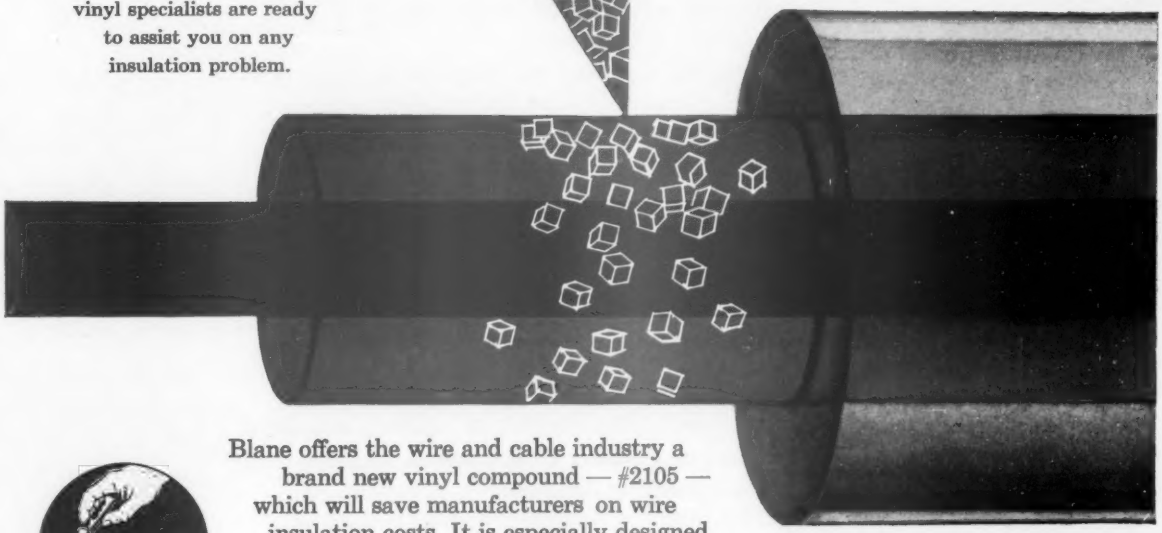
DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *music spring, stainless and plated wires, high and low carbon specialties*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*

BLANE COMPOUND #2105

An announcement to the Wire & Cable Industry:

YOU SAVE ON WIRE INSULATION COSTS WITH THE NEW BLANE COMPOUND #2105!

- Blane Compound #2105 comes pelletized ready for extrusion in natural and all standard colors.
- Blane's quality is equal to the finest in the plastics industry.
- In Blane's laboratory, vinyl specialists are ready to assist you on any insulation problem.



BLANE

Blane offers the wire and cable industry a brand new vinyl compound — #2105 — which will save manufacturers on wire insulation costs. It is especially designed for operating temperatures of 90° and 105°C, and has been approved by UL. Examine Blane's Compound #2105 yourself! For samples and technical data write to —

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THE NEW AND REVISED 1958 EDITION OF THE

WIRE and WIRE PRODUCTS BUYERS' GUIDE AND YEAR BOOK of THE WIRE ASSOCIATION

PUBLISHED ON APRIL 1, 1958

The many new headings—new products, address changes and other important alterations in the listings of sources of bars, rods, wire, wire products, electric wire and cable and of sources for machinery, equipment and supplies used in the Wire Industry—make this directory

AN INDISPENSABLE BUYING AID.

The Year Book Section is also completely new. It contains information to keep you posted on the affairs of THE WIRE ASSOCIATION, such as:

- OFFICERS AND DIRECTORS FOR 1958.
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- LIST OF MEDAL AWARD WINNERS AND HONORABLE MENTION AWARDS.
- CONSTITUTION AND REVISED BY-LAWS.
- HISTORY OF ASSOCIATION ACTIVITIES DURING 1957.
- INDEX TO ARTICLES AND SUBJECTS IN WIRE AND WIRE PRODUCTS FOR 1957.
- INDEX OF AUTHORS FOR YEAR OF 1957.

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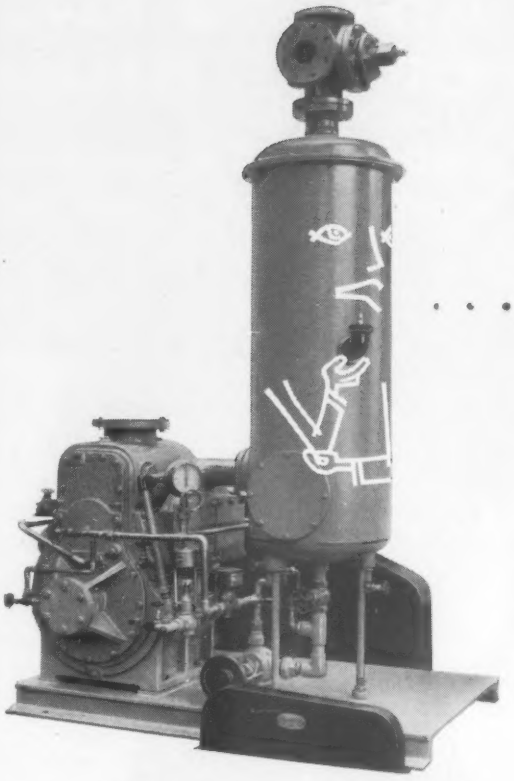

The Kinney High Vacuum Pump illustrated has a free air displacement of 310 cubic ft. per minute and is capable of reducing air pressure to one-seventy-six-thousandth part of an atmosphere. Used on atomic power projects and Air Ministry high altitude chambers etc., and suitable for many other vital industrial purposes.

. . . . . Generally speaking

we are general engineers

but certainly not general engineers by nature. We are, in fact, very specialised engineers.

As general engineers, however, we started our business nearly forty years ago and this wide experience of engineering design and production has been of inestimable value in our later specialisation. Allied to this experience has always been our continuous interest in seeking out the ultimate possibilities of the various products and an insistence on the employment of only the most worthwhile engineering techniques and methods of production.

Take, for instance, our new **TA. 15 Automatic Dual Reel Take-up** designed principally for the wire manufacturing and electric cable manufacturing trades, but suitable for many other trades where high-speed reeling is required. This machine has not evolved from earlier, elementary types, but is a completely new idea in its own right. Immediately details of its operation were released it was acclaimed as being revolutionary and enquiries about its outstanding performance have been received from distant parts of the globe.

In the vacuum field, where many previously undreamed applications are now expected possibilities, we are retaining the initiative in pump and equipment design. News of the new mechanical booster has been received with great approval everywhere, creating for itself a position in high vacuum unoccupied by any predecessor.

Apart from the more standard products we are also well known for our co-operation with customers in the development and production of special plant of all types.

If you would like to know more about us we will gladly send you a printed Summary of Products, or if you have an interest in any special items of equipment we will be pleased to send you the individual information concerned. Write or telephone the Works or any of our district offices. We shall be pleased to be of the utmost service.

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PAYOFFPAK®

"pays off"

for wire converters

TEN Labor Steps Cut To ONE

Converting 500 pounds of steel wire requires 50 labor steps, according to a survey. That's using wire in old-fashioned coils. But the same job requires only *five* operations using wire in a Payoffpak fibre drum. That's saving work!

Production runs along more smoothly with Payoffpak, too. There are no turning reels to foul you up. No backlash! No overrun or inertia problems! No stops! Payoffpak dispenses a single, continuous strand of wire many miles long—up to 600 pounds of it—with only one threading operation.

Extra light weight keeps tare weight at a minimum with Payoffpak. Makes it easy to handle, too, with hand trucks.

Payoffpak saves you time, work, and money. So be sure the wire you buy is delivered in Payoffpak. It's better! It's by Continental.

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OVER A QUARTER OF A CENTURY OF RELIABLE SERVICE TO THE WIRE INDUSTRY

designing and building Butt Welders for ferrous and non-ferrous wire

MODEL "E" TYPE MICRO-WELD RESISTANCE BUTT WELDER

Many Model "E" MICRO-WELD Butt Welders have been in continuous use for over 25 years. Long service, low operating and maintenance cost have made MICRO-WELD Butt Welders the choice of the Wire Industry.

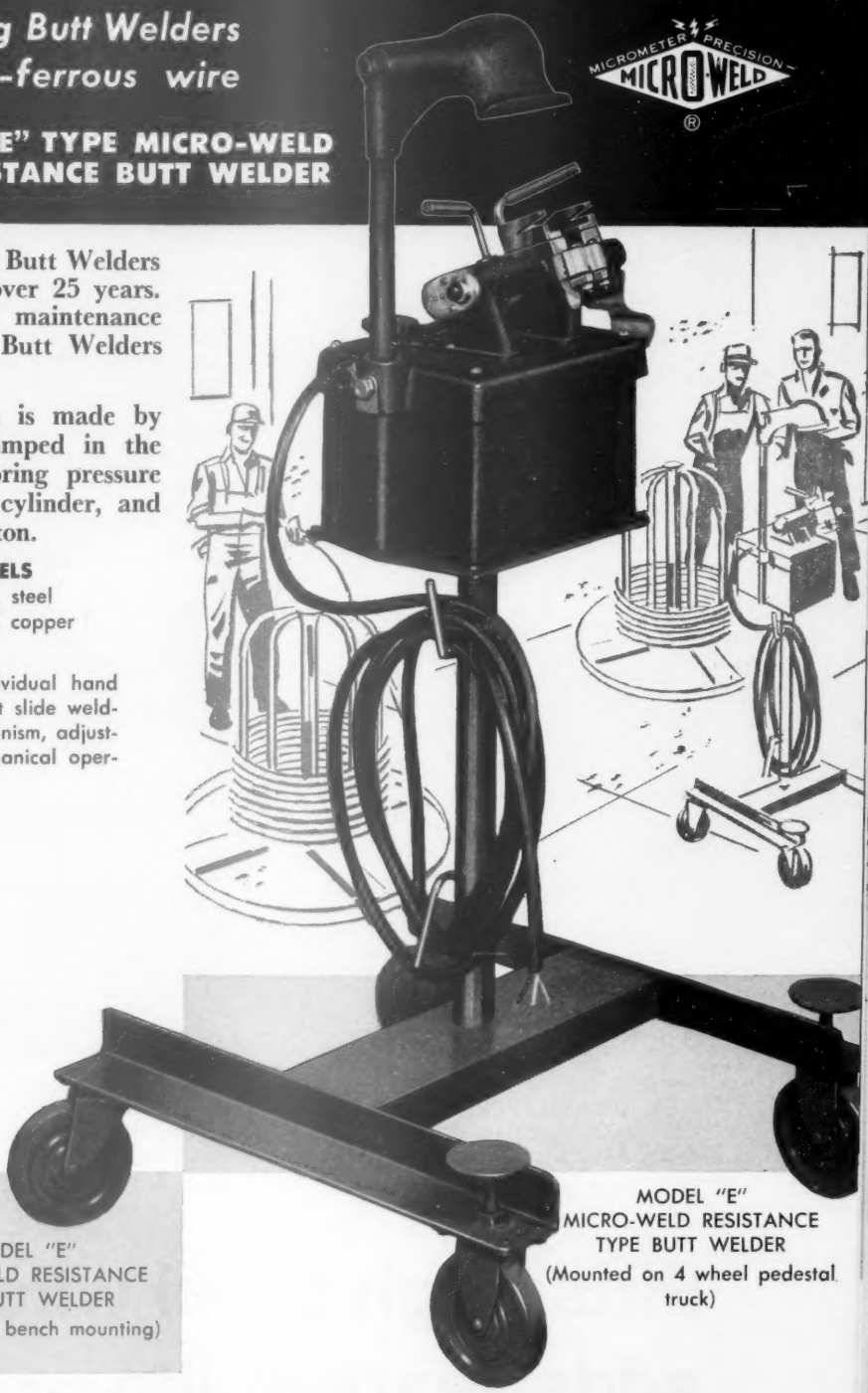
The weld cycle on these welders is made by spacing the headpieces, stock clamped in the welding dies, spacing released, spring pressure applied by rotating indexed dial cylinder, and contacting the welding switch button.

AVAILABLE IN FOUR MODELS

Model "E" — .035" to .225" dia. steel
Model "E-C" — .032" to .128" dia. copper and/or E.C. aluminum

These welders are equipped with individual hand clamps, manual-spring operated straight slide welding headpiece, adjustable spacer mechanism, adjustable welding heat control switch, mechanical operated limit switch, and extension cord.

MODEL "E"
MICRO-WELD RESISTANCE
TYPE BUTT WELDER
(Suitable for bench mounting)



MODEL "E"
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TYPE BUTT WELDER
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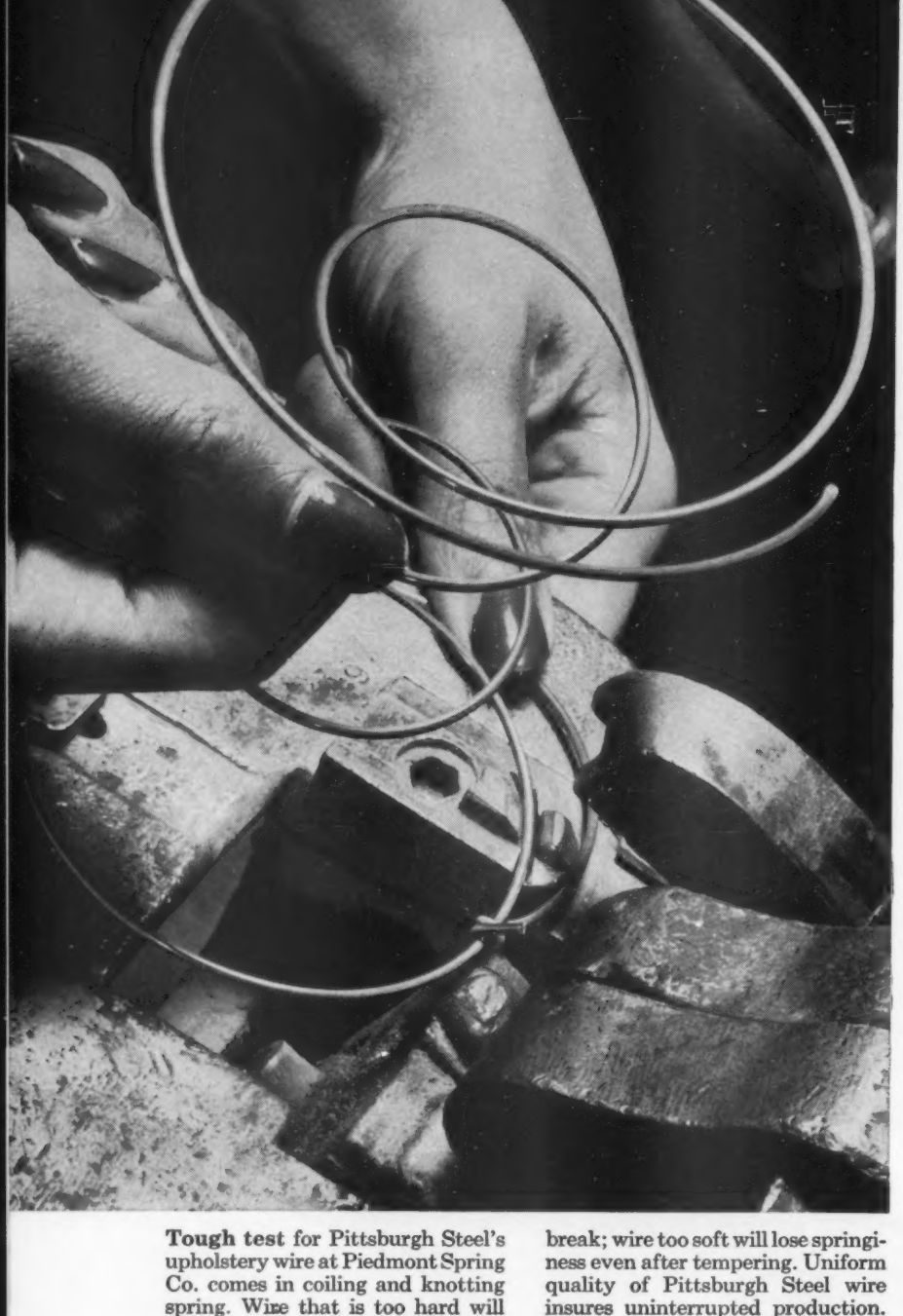

Tough test for Pittsburgh Steel's upholstery wire at Piedmont Spring Co. comes in coiling and knotting spring. Wire that is too hard will break; wire too soft will lose springiness even after tempering. Uniform quality of Pittsburgh Steel wire insures uninterrupted production.

Pittsburgh Steel wire adds years of life to upholstery springs

Piedmont Spring Company calls Pittsburgh Steel upholstery wire "Best we've ever seen"

Pity the poor upholstery spring . . .

It goes through the most torturous stresses and strains just getting made. Then, fully formed and ready for use, all it can look forward to are years and years of supporting tons of jumping, running, standing, sitting or just-lounging human weight.

If that upholstery spring is unappreciated, then consider how underrated its wire can be. You have to be a veteran upholstery springmaker to know what it takes to make a first rate spring that can outlast the furniture it serves.

Such men are Bill and Bob Gaston of Piedmont Spring Company, Hickory, N.C. They choose only superior quality wire—like that supplied by Pittsburgh Steel Company. During their 31 years of combined springmaking experience, the Gaston brothers have seen just about every twist and turn there is to springmaking. Bill Gaston, who handles purchasing, sums up Pittsburgh Steel upholstery grade wire this way:

"Pittsburgh Steel wire is the best we've seen anywhere. And I'd tell that to anyone. It's exactly what a manufacturer needs in this business. We get uniform quality in every shipment."

Combination of quality Pittsburgh Steel high carbon upholstery wire and precision springmaking gives Piedmont upholstery springs enough liveliness and durability to serve several generations of furniture owners.

Liveliness—a must in an upholstery spring—can be seen when the finished spring is compressed. If it springs back to within one-quarter of an inch of its original length, say nine inches in a frame spring, then it has the quality to take years of hard use.

Upholstery wire from Pittsburgh Steel also must be able to withstand severe deformation during coiling and knotting.

Proper grain structure is another must. Too hard—the wire will break, scrapping an entire coil. Too soft—the wire will coil and knot easily—but it will be lifeless even after tempering. Plant Superintendent Bob Gaston cites another all-important requirement:

"The wire we use must have uniform diameter—only .001 variation plus or minus allowed up to .075-inch and .002 variation for .076-inch and larger. If the wire didn't meet our close tolerances, it would seriously damage our coiling machines and stop production. And you know what that does to costs and lost orders. But there's no worry there with Pittsburgh Steel wire."

Piedmont Spring also uses Pittsburgh Steel's border and brace low carbon wire for edgewire frames that hold cushion springs. This wire must be able to withstand crimping and bending and have enough stiffness to support the finished unit. High carbon upholstery grade wire—.047 to .155-inch diameter—is transformed into cushion, back and frame springs. Lacing wire is used to join springs together in cushion and back frames.

Bill Gaston gives much of the credit for his company's enviable spring reputation and low production costs to wire from Pittsburgh Steel. He states flatly:

"We've never had a complaint from a customer because of the quality of the wire. It has never failed to meet our specs."

"And there's another thing I like about Pittsburgh Steel's performance," Bill adds. "That's the service. We keep a low inventory of wire. Many times we run to the bare minimum, but we always get our shipments on time to keep production going.

"When we want to talk to Pittsburgh Steel's district sales office, we get quick attention from the district manager himself right on down.

"Our aim at Piedmont is to make only the best upholstery springs—springs that will take years of hard use without failure. And we get them thanks to the most important ingredient in a spring—quality wire like ours from Pittsburgh Steel."

These same benefits from Pittsburgh Steel's upholstery grade wire can be yours, too. And they don't stop with upholstery wire. Oil tempered wire, bright basic, core wire, ACSR wire, rope wire, high carbon MB spring wire or any other kind of manufacturers' wire are available to serve your needs.

Trained Pittsburgh Steel engineers are close at hand to put their knowledge and experience to work in helping solve your problems.

Specify Pittsburgh Steel wire. Call the nearest district sales office listed at right. Do it today.

"Best wire we've ever seen" comments Bob and Bill Gaston (left and center) about high carbon upholstery grade wire from Pittsburgh Steel. The two owners of Piedmont Spring Co. check the life in a Piedmont upholstery spring after tempering. After compression, spring must return to within one-quarter of an inch of original length.

Cushion springs are joined together by lacing wire, forming the shape of a cushion frame for an upholstered chair. Piedmont springs made of Pittsburgh Steel wire take years of hard use.

Baling for shipping, Piedmont upholstery springs are compressed to save space. Bill Gaston says, "We've never had a complaint from a customer because of the quality of the wire."

Pittsburgh Steel Company

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District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
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- **Heavy Duty**
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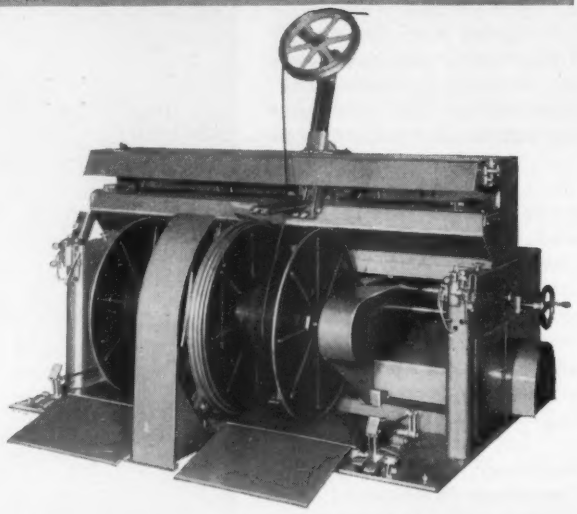
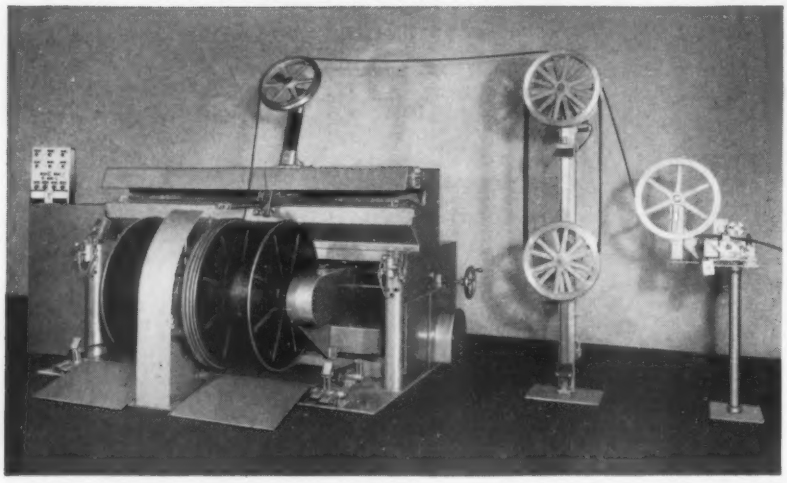
- **Absolute Automatic Wire Transfer.**
- **Each reel driven independently.**
- **Automatic powered cutter for heavy wire size to ⅝″ diameter.**





Line installation showing take-up with dancer, measuring unit, electronic panel and separate operators control station supplied with each unit.

Increase your extruder or continuous vulcanizing line capacity with this new Entwistle High Speed Automatic Shaftless Take-Up installation. Complete unit as shown permits continuous take-up at speeds to 3,000 F. P. M.

Rapid transfer to second reel can be accomplished automatically from counter signal or by manually operated push button. Pneumatically operated side arms make loading and unloading a simple, easy operation. Hydraulic traverse is infinitely adjustable over a wide range.

Automatic powered cutter for insulated wire sizes up to ⅝″ diameter and four speed transmission supplied on 36″ model shown. Hydraulic lifting ramps to cover full reel range of 24″ to 36″ and mechanism for retaining initial end out for testing etc. are available as options.

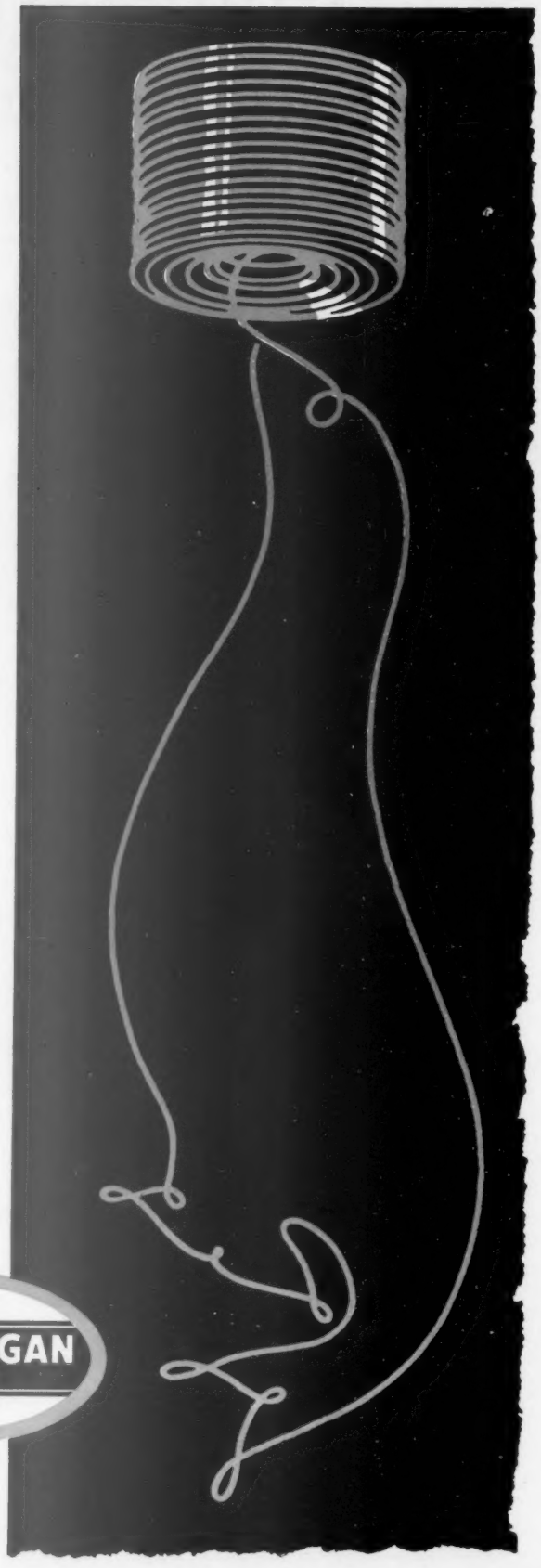
ENTWISTLE

Manufacturing Corporation

1475 ELMWOOD AVE., PROVIDENCE 7, RHODE ISLAND

Over 40 years of dependable service to the Wire Industry

FORMVAR... for a balance of properties



You get more for your magnet wire dollar when you buy wire coated with a phenolic modified Formvar enamel. You get a balance of mechanical, electrical and chemical properties unequalled in the industry . . . with more than 15 years performance as the industry standard. That's why enamels based on Formvar are used on more than 70% of all magnet wire.

Wire coated with Formvar based enamel possesses excellent wet and dry dielectric properties, exceptional adherence, flexibility and elongation, and outstanding resistance to heat shock, abrasion, solvents, acids and bases.

Formvar is the registered trademark for polyvinyl formal produced and sold only by Shawinigan Resins Corporation. When combined with an alkyl phenolic resin it becomes that tough, heat resistant wire enamel you may know as Formvar enamel.

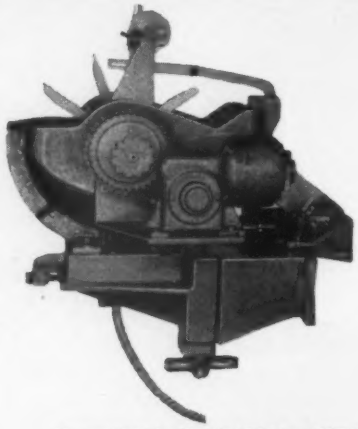
For wire insulations which permit trouble-free service, lower maintenance and production costs, and greater efficiency, look to enamels based on Formvar. Shawinigan's exacting production controls and active applications research keep Formvar a uniform and dependable ingredient for magnet wire enamels. Shawinigan Resins Corporation, Springfield 1, Mass.

SALES OFFICES: ATLANTA CHICAGO LOS ANGELES NEW YORK SAN FRANCISCO

FORMVAR®
polyvinyl formal by

SHAWINIGAN RESINS®

NEW SHUSTER Thread Rolling Machines for Low Cost Production!



Hopper Feed for Models M516S and H516S.

Model M516S
2" thread length.

SPECIFICATIONS

- 3/32" to 5/16" diameter thread, ferrous
- 2" or 3" maximum lengths
- Manual or Hopper feed
- Four models
- 60-100 pieces per minute
- 3 H P Motor or U.S. Varidrive

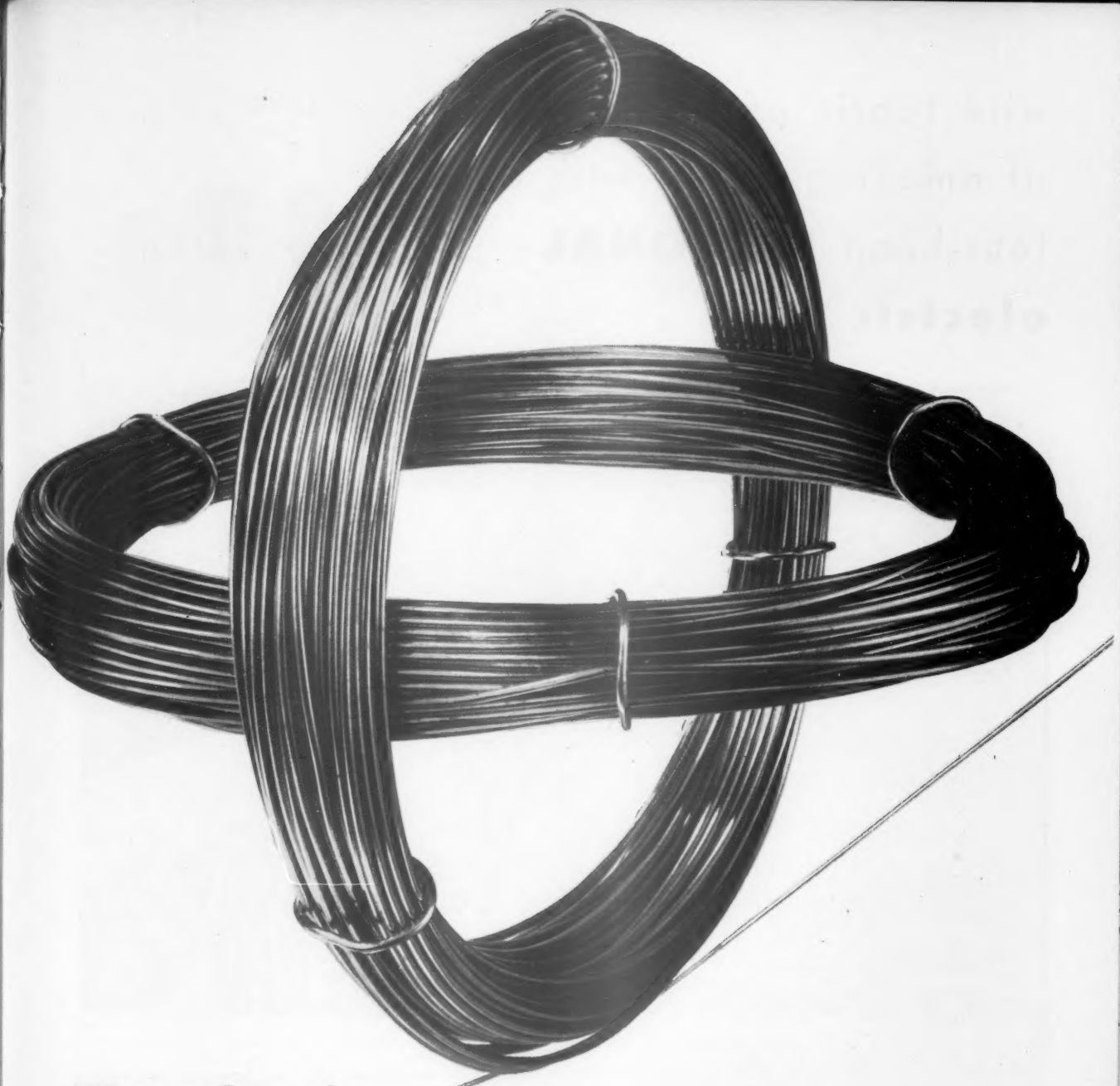
PRODUCTION PARTNER to the famous SHUSTER Wire Straightening and Cutting Machines!

Low Cost thread rolling is *now* available! Here is a brand new, thoroughly tested, compact and rugged machine for both the small and large producer.

The Shuster Thread Roller offers you all the flexibility of production that different dies will allow, at extremely low initial investment. Complete details and prices available on request.

METTLER MACHINE TOOL, INC.

155 West Adeline Street, New Haven, Conn.
Representatives in all principal cities.



Perfect Balance— is the answer to better wire annealing

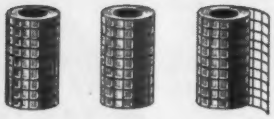
eat balance—that's the answer whether you are annealing rrous or non-ferrous wire. Lee Wilson's exclusive high nvection furnace design eliminates hot and cold spots — sures balanced temperatures throughout the entire furace. This means that every coil of wire or rod in the charge, hether it's at the top, middle or bottom of the spiders, gets he same amount of heat applied to the coil surfaces. very coil comes from the furnace with exactly the same annealing treatment. This is one of the big reasons why more wire and rod are annealed in Wilson furnaces than in all others combined!

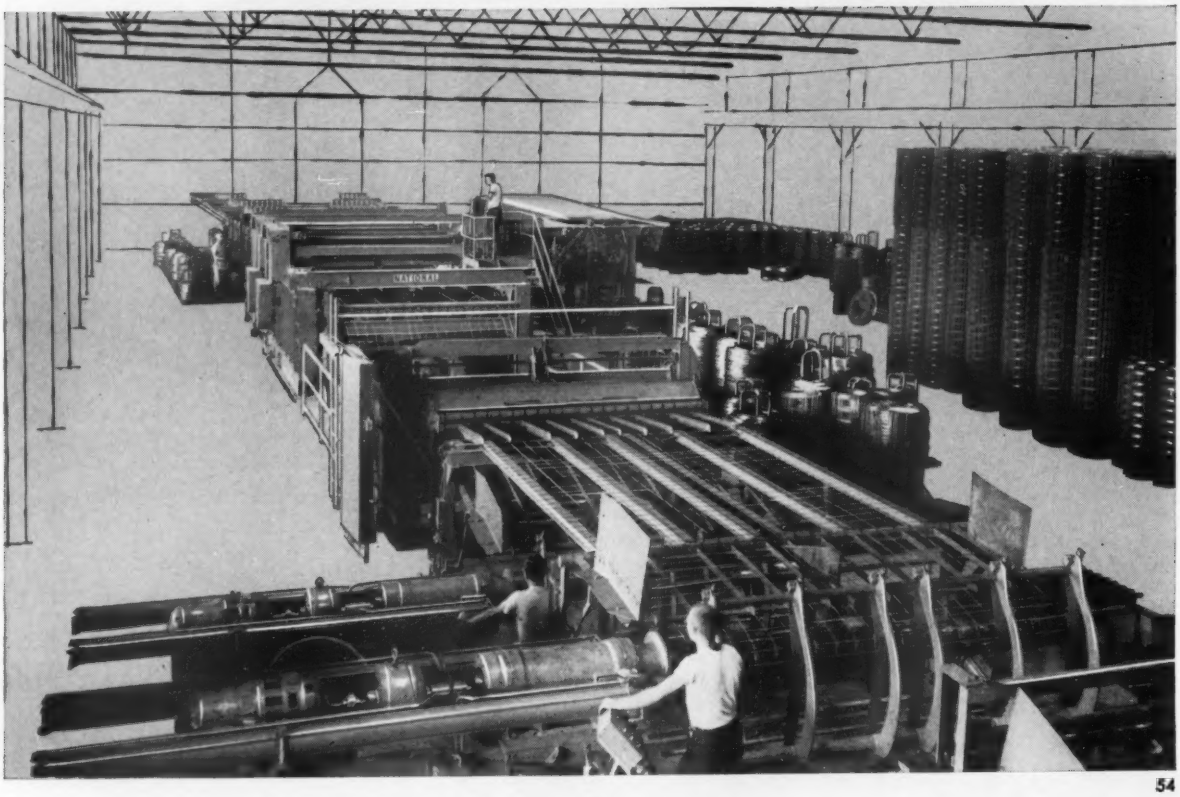
Lee Wilson* ENGINEERING COMPANY, INC.
20005 WEST LAKE ROAD • CLEVELAND 16, OHIO

HIGH CONVECTION ANNEALING FURNACES
MAKE THE BEST METALS BETTER

*ORIGINATORS AND LEADING PRODUCERS OF HIGH CONVECTION ANNEALING FURNACES

wire fabric produced at amazing speed with a four-head **NATIONAL electric unit**





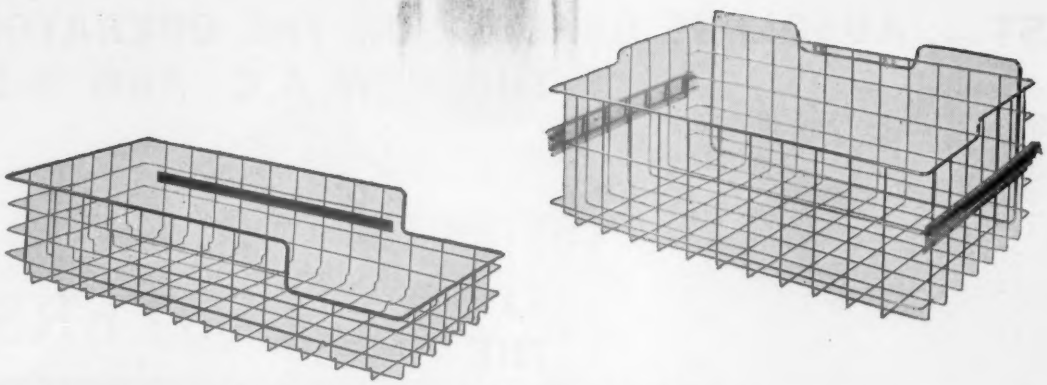
54

160 to 200 feet of 6" x 6" wire-mesh fabric a minute is now being produced by National Electric's newest four-head fabric welder. This amazing speed and the resulting economy is achieved with two dual welding units welding four cross wires simultaneously. The machine welds 22 number 6 gauge, longitudinal wires to 4 number 6 gauge cross wires at one time. Its speed is adjustable from 30 to 60 operations per minute. Components of the new welder include a longitudinal wire straightener and base assembly, four welding heads, mat puller and indexer and a shear. Since the finished fabric may be 120 inches wide in a single width, or in two widths of 60 inches, a special dual coil winding system is incorporated.

National Electric designed this wire mesh welder to meet the specific needs of an individual customer. If you have a volume welding operation, whether it be on home laundry equipment, automotive muffler shells, or jet engine parts . . . the chances are it can be done faster and more economically with an automatic welding unit engineered and built for you by National. Write for complete information.

NATIONAL
Electric welding machines co.
1880 N. TRUMBULL STREET
BAY CITY, MICHIGAN

25 YEARS EXPERIENCE DESIGNING AND BUILDING: SPECIAL & STANDARD • AIR • HYDRAULIC • MOTOR DRIVEN • SPOT • PROJECTION • SEAM • BUTT • FLASH • RESISTANCE WELDERS • PRODUCTION FIXTURES FOR ALL TYPES OF AUTOMATIC ARC WELDING.



YOUNGSTOWN EXTRA SMOOTH CLEAN BRIGHT BASIC WIRE

Plus Automated Fabrication Techniques Gives High Quality Production to *Bauer* Brothers

Over 75 years of production know-how combined with an excellent background of engineering experience enables the Bauer Brothers Co. of Springfield, Ohio, to provide their customers with economical, intelligent, up-to-the-minute wire product designs.

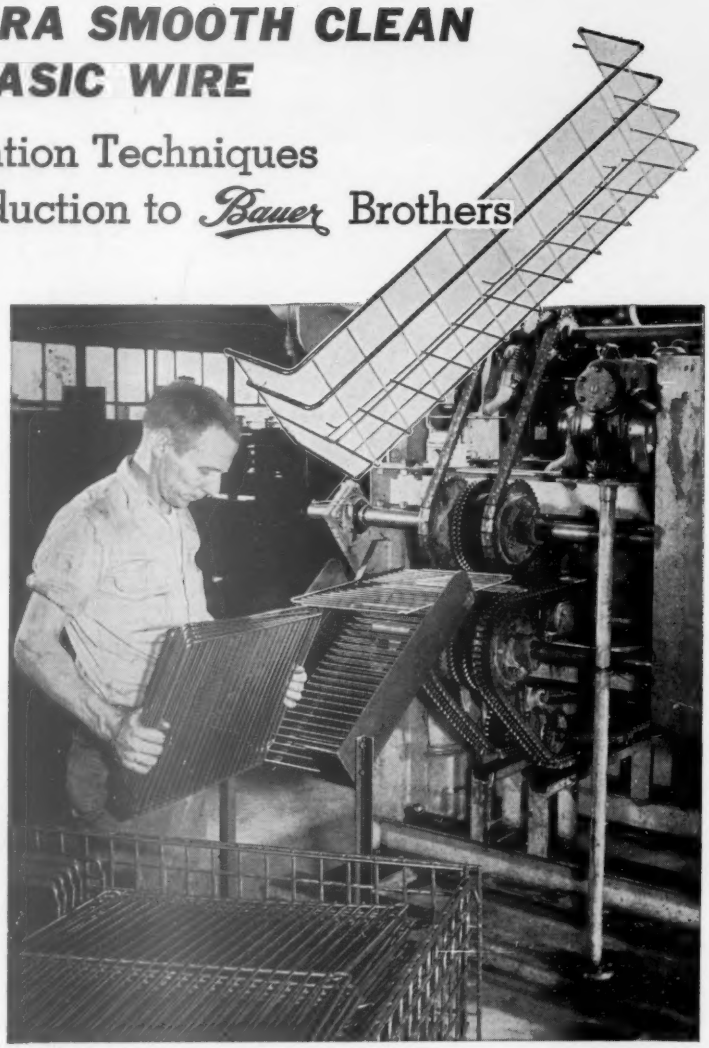
Using the latest techniques in "automation", this progressive fabricator relys on Youngstown's Extra Smooth Clean Bright Basic Industrial Quality Wire to keep both their production and product quality at a high level. They find it forms easily—while still providing the necessary rigidity and strength required in their finished products.

Its surface is free from all oil, dirt and grease which enables plating that's permanent—won't flake off. Also, it spot-welds fast and sure for permanent, strong construction. Why not make it your continuing specification for increased production and profits.

All Youngstown Wire is quality-controlled through each integrated operation from ore mining to final drawing. Thus, you can be sure there will be no injurious seams and piping, laps, die marks or internal tearing and cupping to hold up your production lines.

For additional information or metallurgical assistance, write or phone your nearest Youngstown District Sales Office today.

QUALITY YOUNGSTOWN SERVICE



Bauer's "Flying Dutchman" using Youngstown Extra Smooth Clean Bright Basic Wire automatically fabricates a frame into a finished shelf in only 60 seconds.

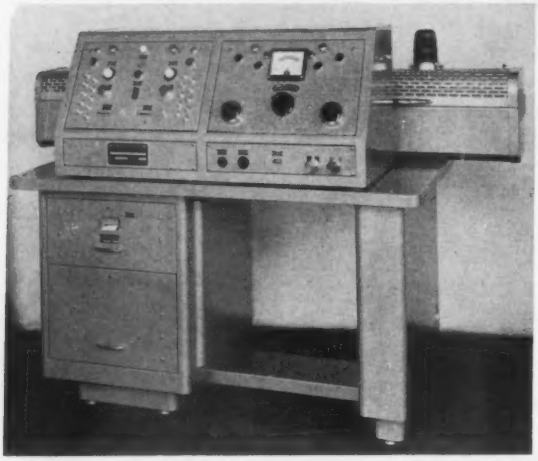
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

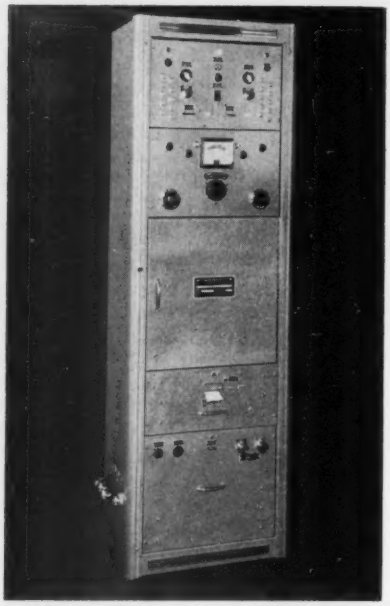
AT LAST... ABSOLUTE SAFETY FOR THE OPERATOR IN THE NEW A.C. AND D.C.

"CONTROLLED POWER"

SPARK TESTERS



Left: Class J, Type JETR-7.5-HE, JLE Supreme Quality Grade Spark Tester and Recorder. Horizontal Console-type, with Electrode Unit mounted on Sparker base, and featuring Printing-type Fault and Reel Recorder.



Right: Class J, Type JETR-7.5-V, JLE Supreme Quality Grade Spark Tester and Printing Recorder. Vertical, space-saving model requiring only 18" x 22" of floor space. Designed particularly for use on plastic extruding or rubber C.V. lines, with remote mounting of Electrode Unit.

NO other feature can contribute more to the efficiency of an operator or to the speed of an operation than that of *absolute safety* in the equipment!

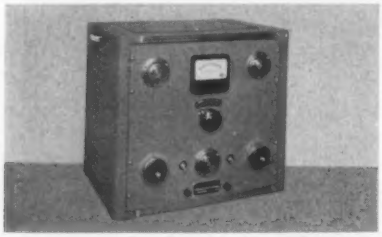
The James L. Entwistle Company's new "CONTROLLED POWER" system, standard on both JLE Supreme Quality Grade and Competitive Grade Economy Spark Testers, offers just such absolute safety by automatically holding constant at 10 milliamps the power available on short circuit throughout the entire testing range.

This value, recognized as safe by authorities throughout the world, is low enough to prevent damage to insulation during its normal period of application, yet high enough to assure accurate testing and positive fault location even at low voltages.

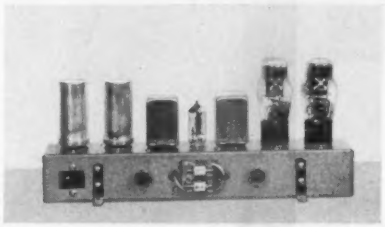
It is also high enough to insure maintenance of the indicated testing voltage at the point of test in spite of leakage to ground along the surface of the wire when wet, or on damp, humid days, and also in spite of the capacitance charging current when using alternating current spark test.

All JLE Spark Testers are now available in both A.C. and D.C. models, and though D.C. testing is not as yet approved by controlling authorities, there are a number of applications where it can properly be used to advantage. Voltage ranges are up to 50,000 A.C. and 80,000 D.C.

"CONTROLLED POWER", together with multiple fault indicators and line telltales and positive-type safety switches on all access doors, drawers and covers, make JLE Spark Testers the safest and most efficient ever to be offered to the industry!



Competitive Grade Economy Spark Tester, Class K, A.C., Class M, D.C. Normally furnished with series-type fault location circuit, but available with high speed, high sensitivity plug-in fault location circuit at extra cost.



NEW! . . . PLUG-IN ELECTRONIC FAULT DETECTION CIRCUIT, standard and identical on all JLE Supreme Quality Grade Spark Testers. Easily replaced if fault circuit fails or does not come up to speed or sensitivity standards on calibration.

James L. Entwistle Co.

SPARKING THE WIRE INDUSTRY SINCE 1918

P. O. BOX 3674 • CRANSTON 10, R. I., U.S.A.

OUR NEW, MODERN, AIR-CONDITIONED FACTORY WILL BE READY IN JULY

PHONE PA 2-7171 • CABLE "JALENCO", PROVIDENCE

NOT CONNECTED WITH ANY FIRM OF SIMILAR NAME

WRITE, PHONE OR CABLE FOR COMPLETE TECHNICAL DATA FILE

ENGLAND

General Engineering Co. (Radcliffe) Ltd.
Station Works — Bury Road
Radcliffe, Lancashire, England

Who Buys Roebling Upholstery Spring Wire After You Do?

The end-user can hardly be expected to know a great deal about Roebling helical spring wire, border and brace wire, zigzag and no-sag wire, wire for automatic machines, lacing wire...

Thus, the qualities of uniformity, temper, tensile strength, size and finish that are yours whenever you use Roebling Spring Wire mean long life, resiliency under constant use (and abuse) where it counts the most...to those who buy Roebling Upholstery Spring Wire after you do.

For further information on the wide range of types, the consistent superiority and availability of these and other Roebling wire products, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Roebling...Your Product is Better for it

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

NOW

a continuous

TEFLON

extruder

priced to make teflon extrusion profitable

THIS DAVIS-STANDARD RECIPROCATING RAM TEFLON EXTRUDER FOR HEAVY-WALLED TUBING AND CABLE

Designed to produce Teflon products up to ½" outside diameter, the D-S Teflon Extruder delivers a smooth, properly cured finish on tubing and cable. The feeder is accurately synchronized with the piston cycle for high tolerance diameter control on the finished product.

PROVEN PERFORMANCE

D-S Teflon Extruders have been run around the clock day after day without shutdown or loss of product tolerance. In this continuous 24-hour-per-day operation, multiple units of extruders are fed and controlled by one man.

Low initial cost, minimum maintenance and supervision, and high product quality with the D-S Teflon Extruder permit the manufacture of Teflon products at competitive prices.

Licensed by British Insulated Callender's Cables, Ltd.

For further information write to:

D-S MYSTIC CONNECTICUT U.S.A.

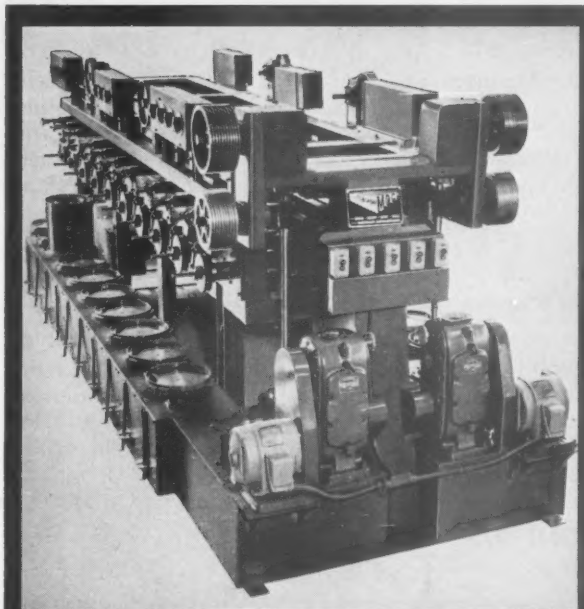
DAVIS-STANDARD

Division of FRANKLIN RESEARCH CORPORATION

10 WATER STREET, MYSTIC, CONNECTICUT

IN EUROPE AND THE STERLING AREA, CONTACT FINNEY PRESSES LTD., BIRMINGHAM, ENGLAND

NEW

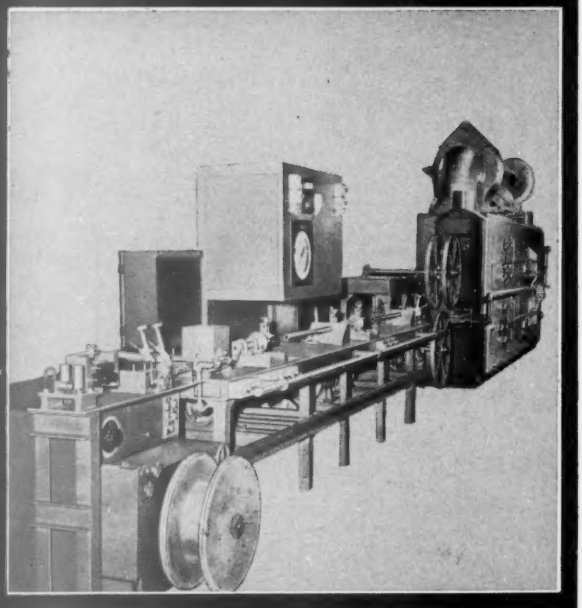


New Reel-R-Drum Packer handles two wire sizes simultaneously at different speeds through the same process.

MOCO's new Reel-R-Drum Packer is setting production records in forward-looking companies. This versatile unit has a speed range from 20 to 120 feet per minute. You can produce two wire sizes simultaneously through the same process at different speeds. Handling wire sizes ranging from .0089" to .025" in diameter, this MOCO Reel-R-Drum packages annealed copper magnet wire on different reels or in nominal 100 lb. capacity Payoffpak Drums, or both simultaneously. This versatile unit is built for tandem operation with a high speed MOCO type "C" wire enameling machine.

New MOCO Machine applies 2 servings of glass or yarn and 4 coats of baked insulating varnish

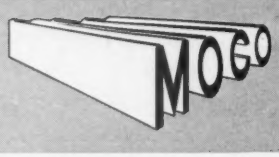
Satisfied users acclaim this new insulating, impregnating and varnish baking machine as a completely revolutionary development in the field of wire enameling. It is capable of turning out large quantities of heavy rounds and rectangulars (up to 150 M. Sq. Mls. Cross Sectional Area), baking on 4 coats of insulating varnish and applying two servings of glass or textile yarns . . . simultaneously! MOCO's revolutionary Rapid-Cool Oven lets you stop production without damage to wire in the oven. Return to full production in a matter of seconds because of the rapid rise of the temperature inside this MOCO Tunnel Oven.

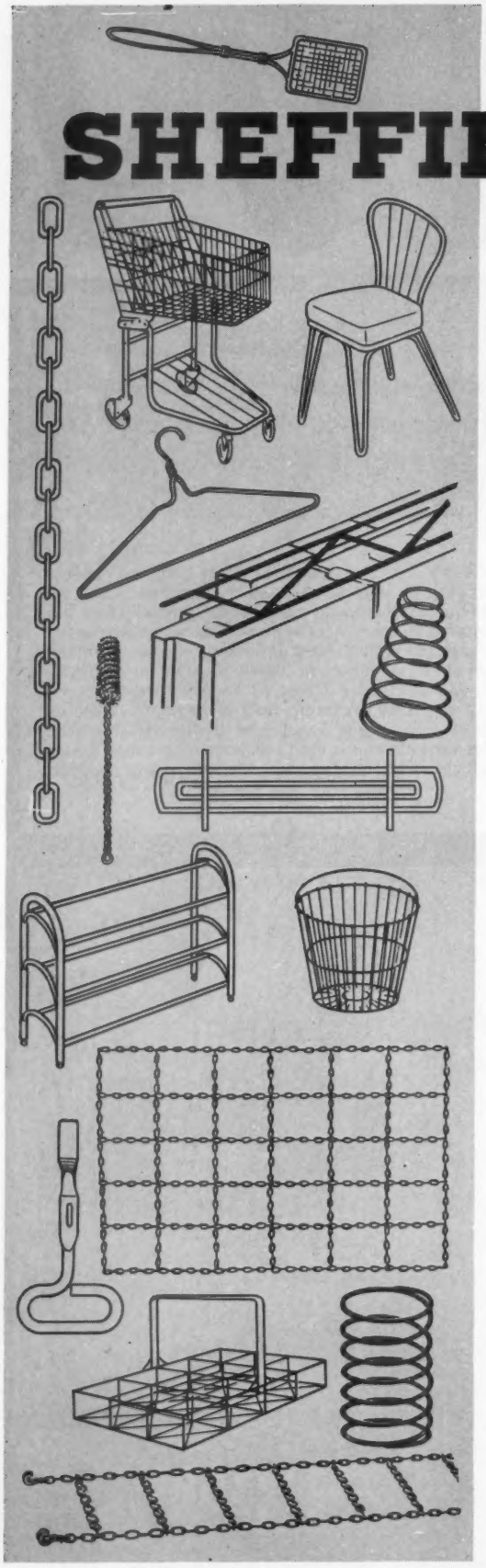


FOR MORE INFORMATION

MICHIGAN OVEN COMPANY

425 BRAINARD • DETROIT 1, MICHIGAN WI-58





Why manufacturers use

SHEFFIELD WIRE

in more than 2,000 quality products

Manufacturers and fabricators depend on Sheffield Wire for unvarying quality and accuracy in meeting their wire specifications. They are sure of getting the RIGHT wire—and getting it fast—because of Sheffield's advanced quality controls and strategic plant locations.

We're old hands at helping customers solve wire problems—with results that speed production, cut costs and improve products.

Let our metallurgists and wire specialists analyze your wire uses. We'll not only come up with the right wire for you, but also may be able to recommend more economical ordering units. This service is yours for the asking. Just call your nearest Sheffield office.

SHEFFIELD KONE PAK*

gives you in one continuous spool the equivalent of 2 to 40 ordinary coils of wire. It gives longer continuous runs, less down time, and can cut scrap losses as much as 90%. The Kone Pak is mounted on a disposable wooden pallet, and can be packed in streamlined cardboard container if desired.

SHEFFIELD ARMCO® WIRE PRODUCTS

Coiled Wire

Annealed—#20 (.035" ga.) through 1"

Galvanized—#20 (.035" ga.) through #4 (.225" ga.)

Bright—#20 (.035" ga.) through 1"

Straightened and Cut Wire

Annealed—#20 (.035" ga.) through ¾"

Galvanized—#20 (.035" ga.) through #4 (.225" ga.)

Bright—#16 (.0625" ga.) through ¾"

* Patent Pending

New ALUMINIZED WIRE
16 ga. (.0625") through 6 ga. (.192")
WRITE FOR FREE SAMPLE

SHEFFIELD DIVISION

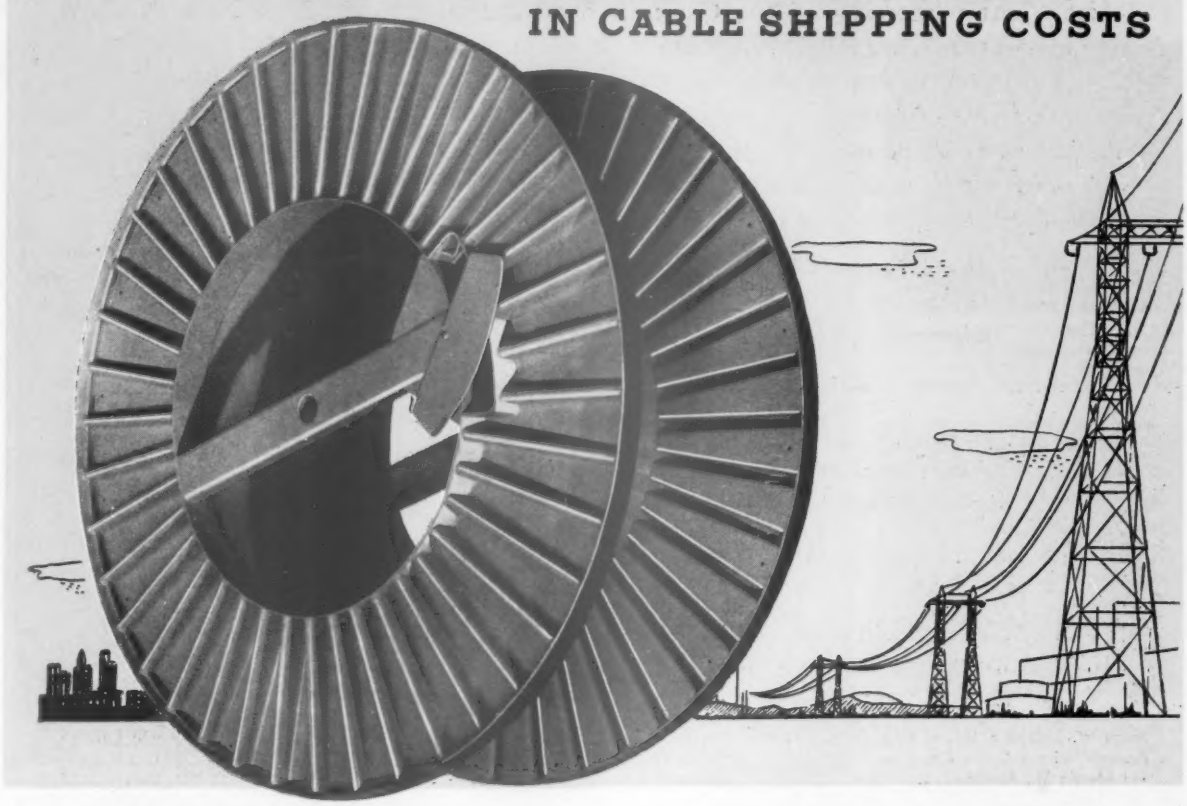
ARMCO STEEL CORPORATION

SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA

20-YEAR RECORD REVEALS

GREAT REDUCTION

IN CABLE SHIPPING COSTS



EVANS LIGHT WEIGHT

TOROIDAL METAL REELS

25% AVERAGE WEIGHT SAVINGS PER REEL

Toroidal design helps cut weight and freight costs to a minimum. Permits easier, faster, lower cost handling.

OUTLASTS 5 WOOD REELS

Evans metal reels have a proven service life of 20 reel trips. Many thousands of these reels have *lasted over 50 trips.*

CUTS MAINTENANCE COSTS

Cost records show Evans reels effect a 50% savings over wood . . . when Evans special repair kit is employed.

For more complete information write to Chicago Sales Office: 208 South LaSalle Street.

THE GEORGE EVANS CORPORATION
MOLINE, ILLINOIS

ELECTRIC WIRE & CABLE SECTION NEWS

At a meeting of the Committee on March 25, 1958, in New York City, several important decisions were arrived at, bearing upon future Association policies with respect to this Section. These were:

- The Committee will be responsible, in association with meeting program committees, for securing papers relating to electric wire and cable for the programs of the annual convention and the regional meetings.

- The Committee will organize a Papers Reviewing Committee whose job it will be to upgrade the quality of the papers and check the authority of technical information.

- The Committee is to plan subjects treated so that papers, at least in any one technical session, bear a relation, one to another.

The decisions of the Committee are to be submitted to the Association's Board of Directors for approval at the annual Spring meeting.

The Committee

Since publication of the committee membership in March, new members have been added. The complete list presently is as follows:

Hugo W. Biskeborn, Dir. of Mfg. (Chairman)
Ansonia Wire & Cable Co.
111 Martin St., Ashton, R. I.

Harold W. Adams, Prod. Supvr.
Cable Div. Reynolds Metals Co.
2500 So. 3rd St.
Louisville 1, Ky.

David Barr, Plant Eng.
National Electric Products Corp.
338 14th Street
Ambridge, Pa.

Grover W. Brown, Mgr., Machinery Development
The Okonite Co.
Passaic, N. J.

G. E. Forsberg, Vice-President
Surprenant Manufacturing Co.
172 Sterling St.
Clinton, Mass.

Charles M. Fredrickson
Southern Electrical Corp.
P. O. Box 989, Chattanooga, Tenn.

James S. Higgins, Plant Eng.
Walker Brothers,
Conshohocken, Pa.

R. W. Higginbottom, Chief Cable Eng.
Triangle Conduit & Cable Co.
P. O. Box 711
New Brunswick, N. J.

Alexander A. Kerr, Supt.—Prodn.
Electrical Wire Div.
John A. Roebling's Sons Corp.
Trenton 2, N. J.

Clement C. Lawson, Plant Facilities Engineer
Bell Telephone Laboratories, Inc.
Murray Hill, N. J.

Alfred H. MacGillivray, Supt.
Collyer Insulated Wire Co.
249 Roosevelt Ave.
Pawtucket, R. I.

Urbain J. H. Malo, Technical Dir.
The Crescent Co., Inc.
Front & Central Ave.
Pawtucket, R. I.

W. R. Moyers, Chief Eng.
Wire Engineering Dept.
Western Electric Co.
P. O. Station B
Buffalo 7, N. Y.

J. C. Murray, Jr., Vice-President
Crescent Insulated Wire & Cable Co.
319 N. Olden Ave.
Trenton 5, N. J.

D. M. Schmid, President
Techalloy Co., Inc.
Rahns, Pa.

Philip H. Snyder, Plant Mgr.
Wire and Cable Div.
The Electric Auto-Lite Co.
601 Poplar St.
Hazleton, Pa.

H. S. Spaulding, Tech. Supt.
Kaiser Aluminum & Chemical Corp.
P. O. Box 671, Newark, Ohio.

Roger T. Stafford, Project Engineer
Kennecott Wire & Cable Co.
Phillipsdale (Rumford 16), R. I.

Marshall V. Yokelson, Res. Met.
General Cable Corp.
Bayonne, N. J.

Further details will be reported as they develop.

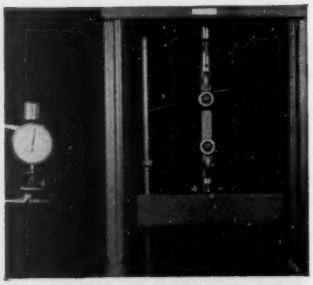
THE WIRE ASSOCIATION

RICHARD E. BROWN, *Executive Secretary*

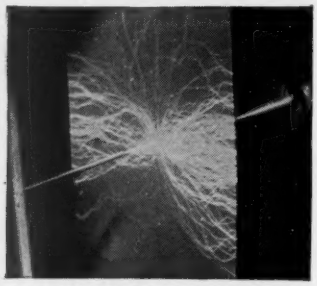
453 MAIN STREET • **STAMFORD, CONN.**

PROPERTIES OF "MYLAR"

"Mylar" offers a unique combination of properties that may help you improve performance and lower costs of *your* product. Here are two of the many important properties for evaluation.



HIGH TENSILE STRENGTH. "Mylar" is strong and durable. Instron Tester shows an average strength of 20,000 psi. It's dimensionally stable . . . resists moisture.



HIGH DIELECTRIC STRENGTH. Average of 4,000 volts per mil . . . average power factor of 0.003 to 60 cycles . . . dielectric constant above 3.0 at 72°F., 1,000 cycles.

General Cable reports . . .

New shielding assembly with Du Pont Mylar® limits oil drainage . . . restricts moisture pickup

PROBLEM: To provide an outer shielding assembly on General Cable's high-voltage, high-pressure pipe-type cable. The assembly had to resist oil drainage during shipment and storage as well as restrict surface-moisture pickup during installation.

SOLUTION: After extensive tests on various materials, General Cable Corporation adopted two new tapes for the outer shielding assembly . . . one tape was "Mylar"* polyester film; and the other, a "Mylar"/foil lamination.

RESULTS: General Cable tests showed that "Mylar" provided a tight, yet flexible, assembly and effectively reduced oil drainage. The high tensile strength and other excellent physical properties of "Mylar" permit its application to the cable under high tension. "Mylar" restricts surface-moisture pickup when the cable is exposed to air during installation. "Mylar" is not affected by the insulating oils . . . has no plasticizer . . . will not contaminate other materials.

How can "Mylar" help you? Whether you manufacture heavy-duty cable or tiny capacitors, it will pay you to evaluate the combination of properties found only in "Mylar." And when figured on an area basis, this tough, thin polyester film will often *cost less* than your present insulating material. For more detailed information, send in coupon.

DU PONT
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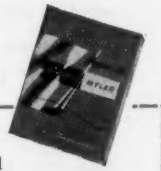

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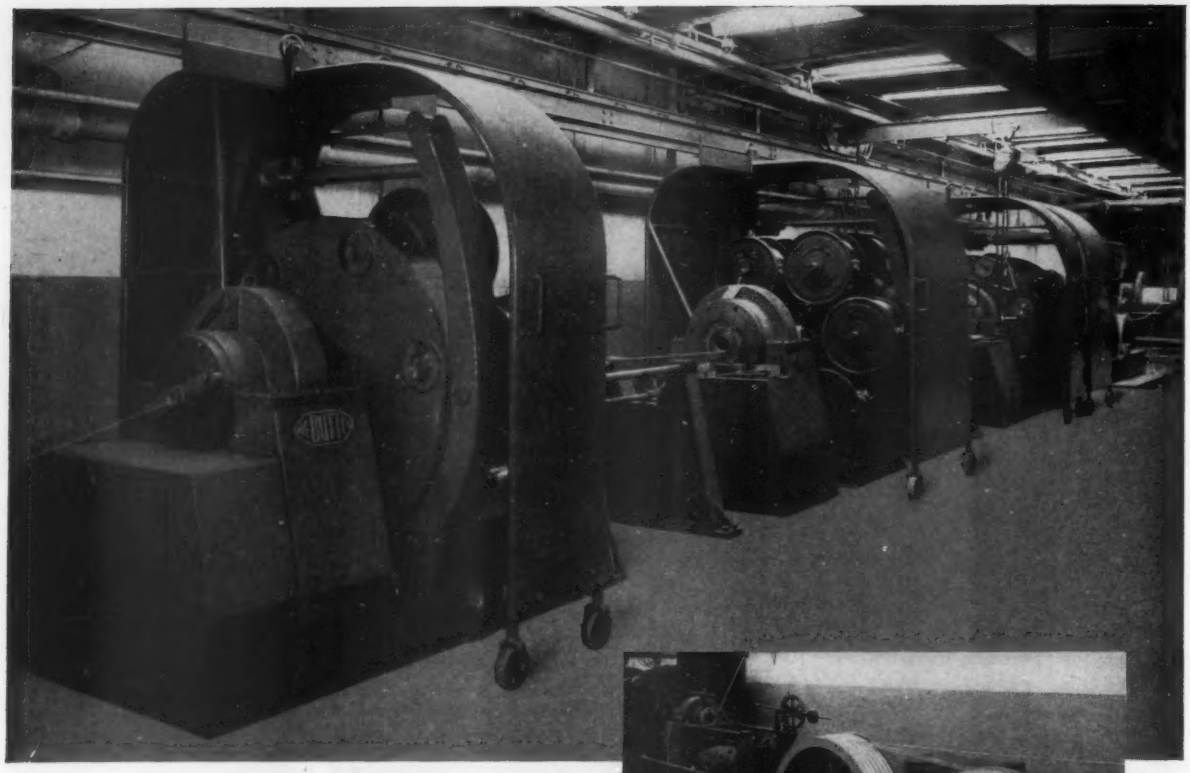

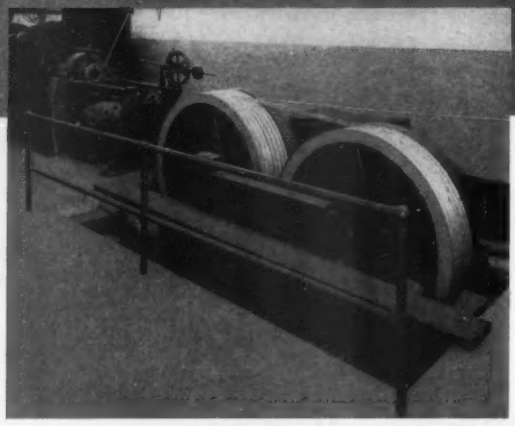

60" multi-groove capstans tilted for straight pull on cable without chafing. Both capstans are driven.

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For complete information and prices, contact New England Butt Company, Division Wanskuck Company, 304 Pearl Street, Providence 7, R. I. or James Day (Machinery) Ltd., 28 Maddox Street, London W-1, England.

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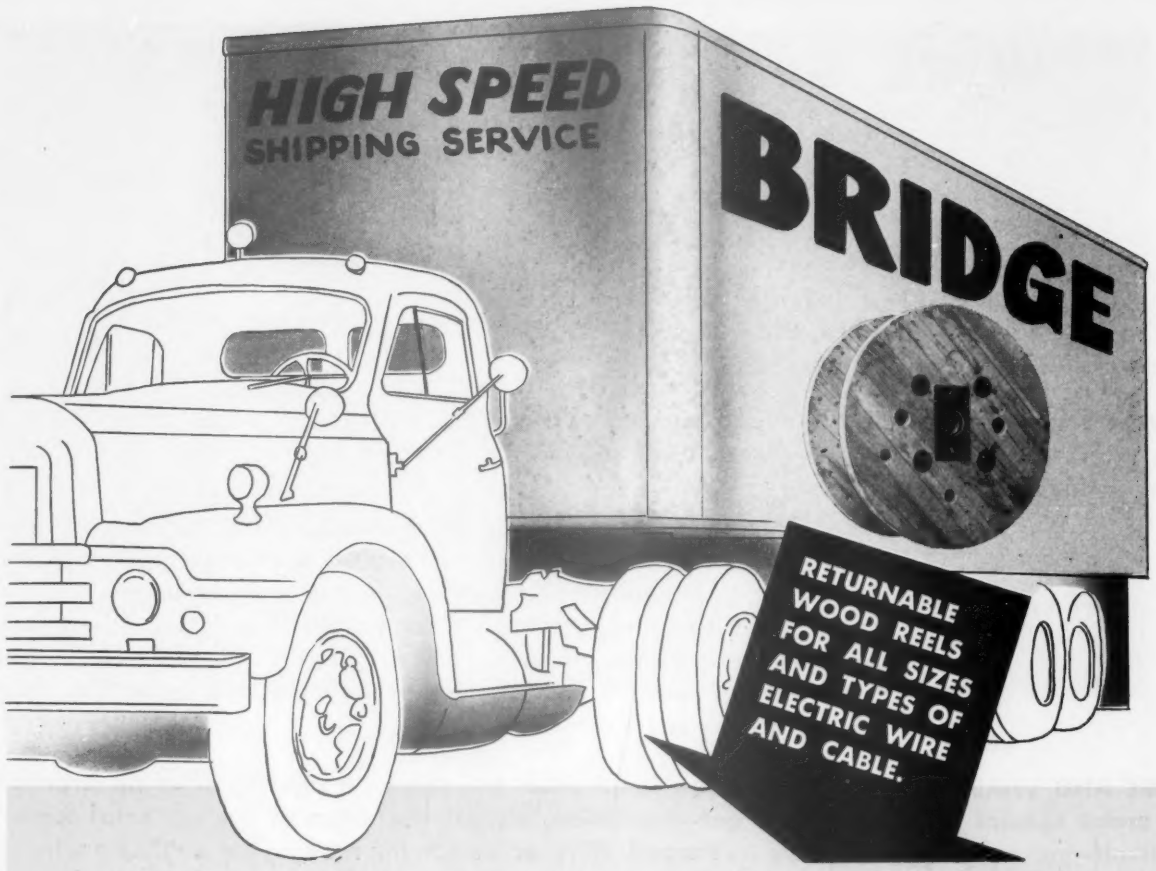

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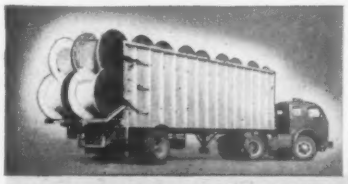

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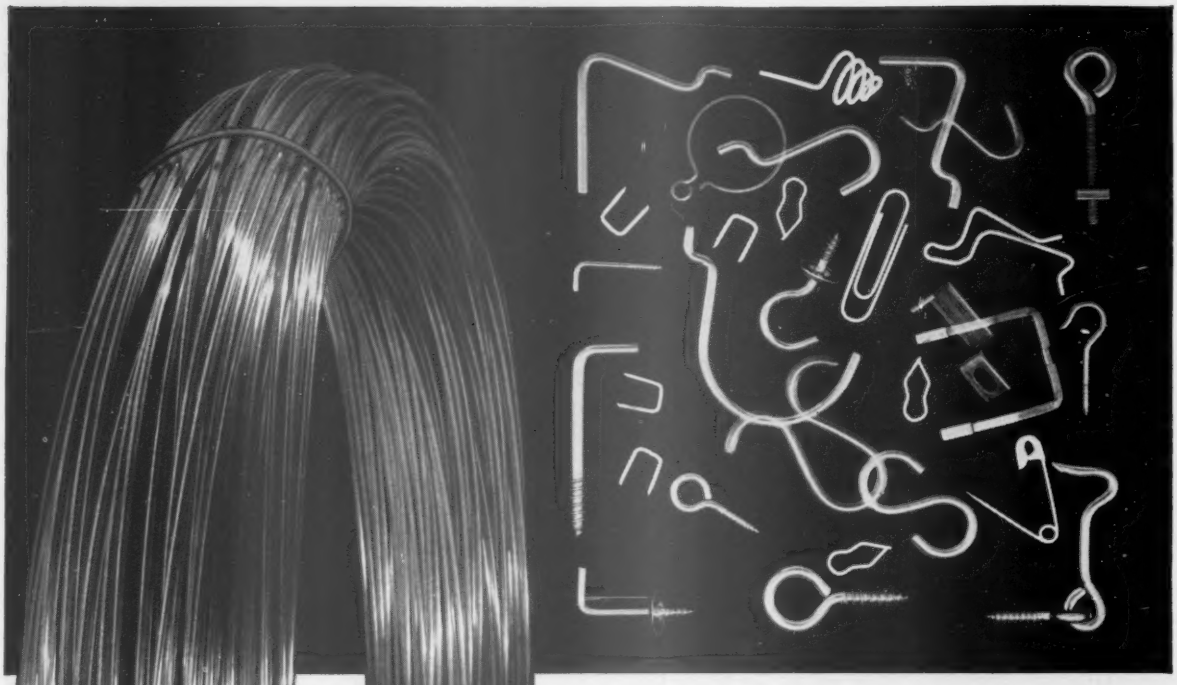

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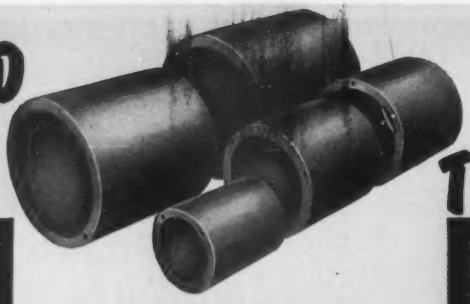

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GARRETT, INDIANA

The Wire Outlook

There have appeared in some of our prominent business publications from time to time editorials favoring free trade—or at least a gradual attainment of it through the extension of the Trade Agreements Act.

This bill empowers the Administration to lower duties on imported products, although, as pointed out previously, it includes an "escape clause," under which businesses that can provide evidence of material damage may seek redress.

According to Secretary Weeks, two safeguards are provided by the act: first, the "peril point" procedure, designed to identify commercial injury before tariffs are lowered; and second, the "escape clause," under which individual firms are provided with a procedure to seek a remedy where lowered tariffs have resulted in injury. Public hearings, before and after concessions, will be held, testimony studied by the Tariff Commission and findings submitted to a Presidential review.

A number of efforts to seek such redress on the part of individual manufacturing firms have been called to our attention. The net result has been sympathetic response, but no action, even when in one instance carried to the State Department.

This country bore the financial brunt of the war. It bore the brunt of the rehabilitation of war-torn Europe. It has financed businesses and projects abroad, many of which have had the effect of setting up production facilities that are now competing with American taxpayers by virtue of money that our taxpayers have been forced to supply to their disadvantage through the continuation of burdensome, war-level taxation.

We are aware of all the arguments used to justify our nation's actions—principal of which is to save our overseas friends from going over to the Communist camp. Undoubtedly much could have been accomplished in this direction without lavish outlays of billions of dollars, a great portion of which has been wasted on many unneeded and unwanted projects that have been fostered by our bureaus. Occasional exposures of such wasteful spending have been aired with no visible results in the Readers' Digest and elsewhere. These projects are more often than not the actions of overweening bureaucrats, who spend for spending's sake.

Basic to our dilemma is the national debt, perhaps twice as large as it needed to have been to win the war, and the devaluation of the dollar by degrees, often a matter of whimsy, according to Mr. Morgenthau. This provided two major inflationary forces for which we are paying and for which we shall pay for some time to come. We damn labor for its continued insistence on higher wages and more benefits. Possibly it is in some measure the victim of the pressure of an economic law that is bigger than unionism.

However that may be, our wage scales are increasing constantly and have risen to levels that put us out of step with the rest of the producing world, which hasn't had to build up disproportionate debts. We have assumed the burden of financing not only the free world, but of some Red-dominated countries, like Poland and Jugoslavia.

The net result of our openhandedness is that goods of every sort, durable and soft, produced in other countries, are entering our markets at prices that are under our costs of production.

We talk about our recession. But the predicament in which many manufacturers find themselves is directly traceable to imported, low-priced goods. To this competition the wire industry can attribute much of its current condition. Our wire machinery and wire product manufacturers just can't meet prices that are anywhere from 20% to 50% under ours. Distress in the wire industry is not due to a corrective recession.

Eutopian ideas are fine as an ultimate goal. Trouble arises when "do-gooders" in high places force these "ideals" upon our economy at a time when the rest of the world is so far behind us in wage and living standards.

Trade could still be "free" were duties, having the sole purpose of equalizing wage differentials of this and other nations, imposed. Our lawmakers and economists appear to have failed to grasp this fact. Then the products of our neighbors could enter this country on a basis of equalized costs, competition would be fair, and the consuming public could judge products solely on merit, instead of on price alone.

Those of our industries who have been seriously damaged should organize themselves to present their plight and the solution to Washington. This is a vastly different principle from the protective tariffs of days of yore.

Edmund Durel Sickels

EDITOR

In selling wire drawing lubricants...

...in playing golf...

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WIRE
AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 33 MAY, 1958 No. 5

Graphical Computations For Wire Drawing Machine Characteristics

by

William J. Owens, Jr. and Claude C. Smith, Jr.
Engineer—Manufacturing Standards Manufacturing Engineer
Wire and Cable Department
General Electric Company
Bridgeport, Connecticut

The nomograms published in conjunction with this article have been devised by the authors for practical use in the drawing of copper and aluminum wire.

Throughout the years many formulae have been created to predict the operation and characteristics of wire drawing machines. Many of these are of simple algebraic form and easily used, but in some cases the equations are of fractional exponential or trigonometric type, posing a problem in solution for the average person seeking information. In all cases the calculations can be time consuming if a thorough study is to be made of any type of drawing machine.

★ ★ ★

With this in mind, a series of nomograms or alignment charts have been constructed to simplify the use of these formulae and to speed up the work of calculations.

★ ★ ★

It follows that a definition of terms is necessary to align a thought sequence for an adequate analysis of a wire drawing machine, so that these nomograms can be understood and effectively used.

★ ★ ★

Die Pull—The formula for die pull may be considered of initial interest in a step by step analysis of our wire drawing machine characteristics. Die pull can be defined as pounds pull required to draw wire through a die with a resultant reduction in wire diameter and cross sectional area. (See Fig. 1)

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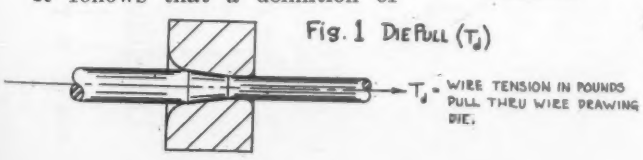


Fig. 1 Die Pull (T_d)

A die pull formula, contributed over twenty years ago by E. W. Clark of General Electric Company, states:

★ ★ ★

Pounds pull T_d is equal to the tensile strength in psi of material to be drawn, times the reduction in area in square inches, times the value of one plus the quantity "the cotangent of one half the die angle times the coefficient of friction" or:

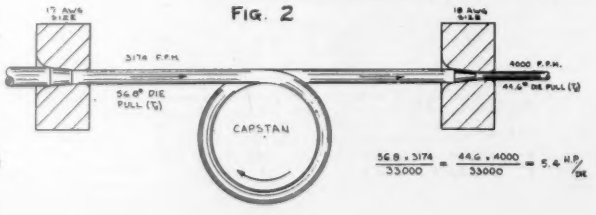
Formula (1)

T.S. (A-a) (1 + [cot ½ Die Angle X C.F.]) = lbs. pull

★ ★ ★

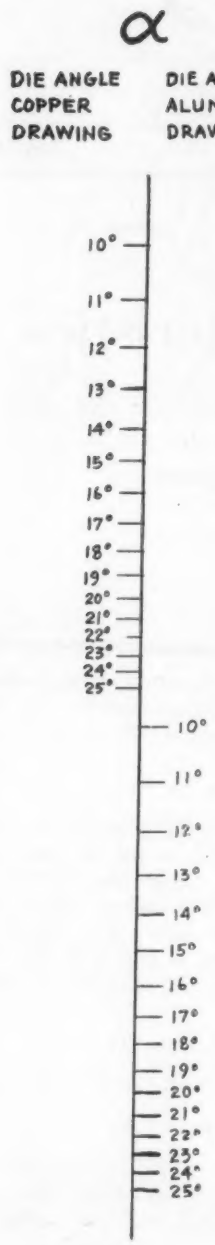
Nomogram "A", constructed from this formula, simplifies and reduces the time required to deter-

Fig. 2



NOMOGRAM FOR WIRE DRAWING DIE TENSION BASED ON MATERIAL, DIE ANGLE AND AREA REDUCTION

NOMOGRAM-A



T_d = WIRE TENSION AT DIE EXIT IN POUNDS

α = DIE ANGLE IN DEGREES

d = WIRE DIAMETER AWG (DIE EXIT SIZE)

D = DIE ENTRANCE SIZE

(D^2-d^2) = AREA REDUCTION IN C.M.

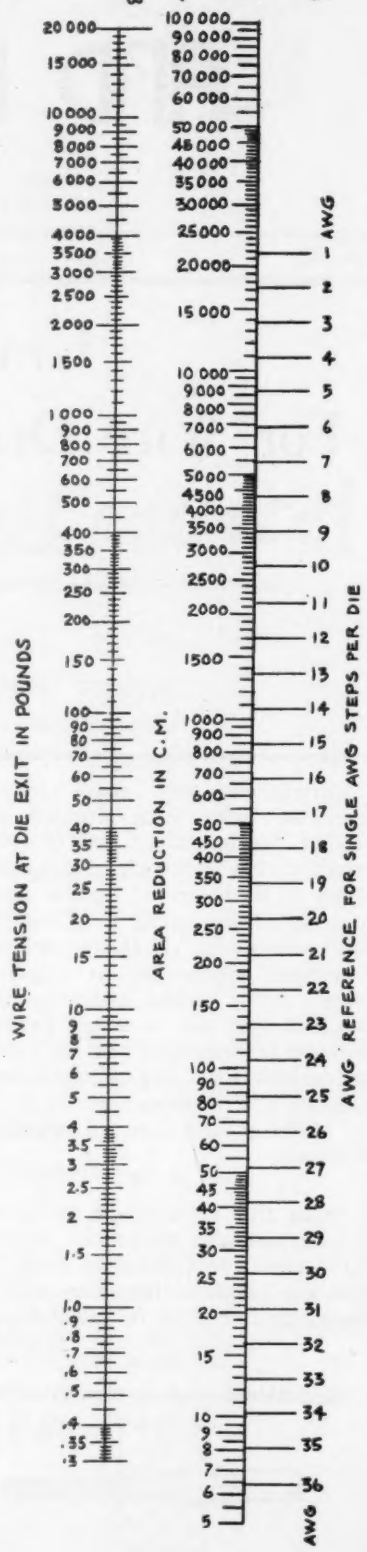
To Use:

PLACE A STRAIGHT EDGE THRU DIE ANGLE ON LEFT SCALE (α) FOR COPPER, OR RIGHT SCALE (α) FOR ALUMINUM AND AREA REDUCTION IN C.M. (D^2-d^2) SCALE, OR IF STANDARD AWG STEPS OF DRAWDOWN USE WIRE DIAMETER IN AWG REFERENCE SCALE (d).

READ WIRE TENSION AT DIE EXIT IN POUNDS WHERE STRAIGHT EDGE CROSSES SCALE (T_d)

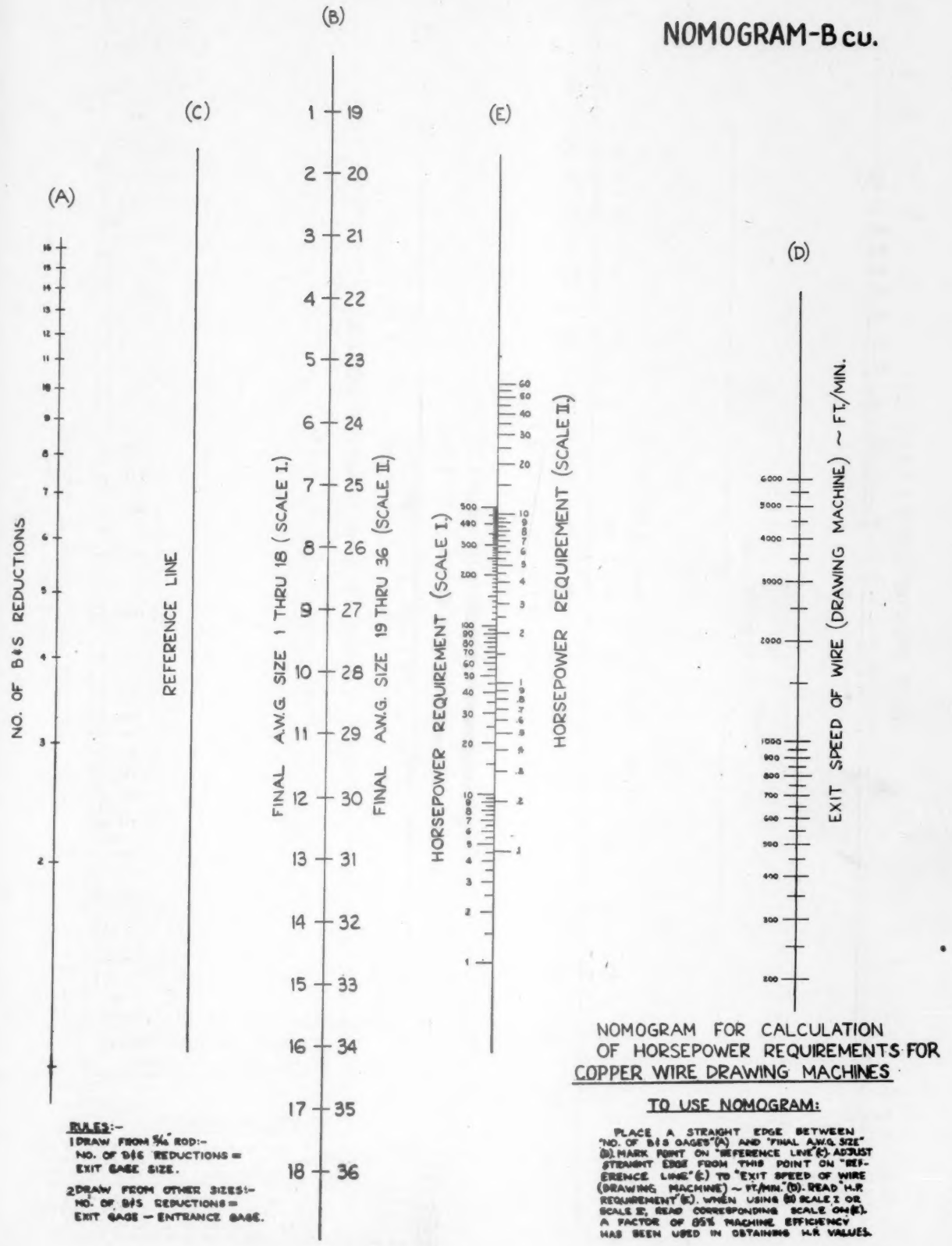
FORMULA:

T_d = (TENSILE STRENGTH OF WIRE BEING DRAWN) × (AREA REDUCTION IN SQUARE INCHES) × (1 + [$\cot \frac{1}{2}\alpha$] [COEFFICIENT OF FRICTION]).



W.J. OWENS FPF
AUG. 23, 1957
MAN-
P-1957-151

NOMOGRAM-B cu.



RULES:-

1 DRAW FROM 5/16" ROD:-
NO. OF B&S REDUCTIONS = EXIT GAGE SIZE.

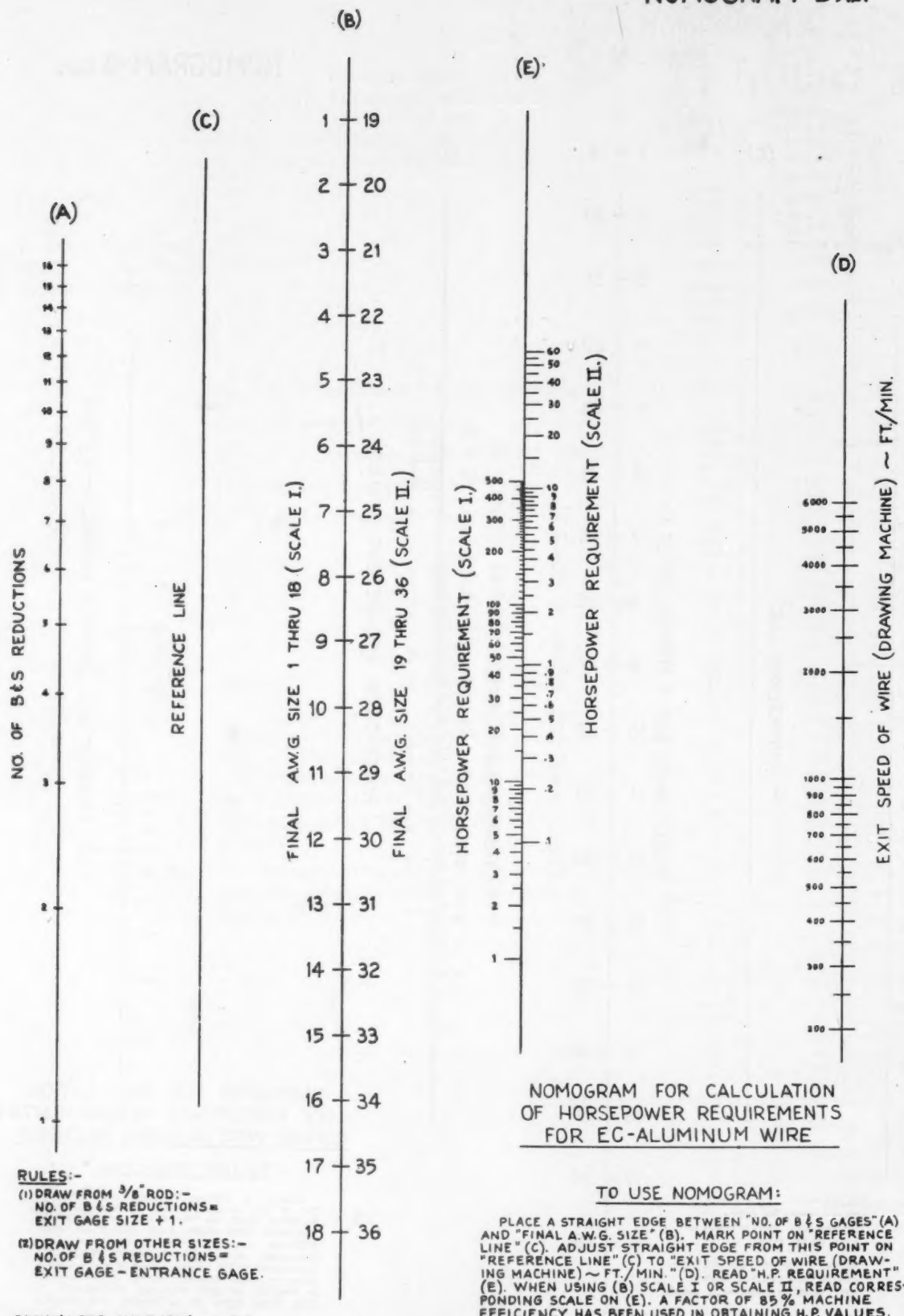
2 DRAW FROM OTHER SIZES:-
NO. OF B&S REDUCTIONS = EXIT GAGE − ENTRANCE GAGE.

NOMOGRAM FOR CALCULATION OF HORSEPOWER REQUIREMENTS FOR COPPER WIRE DRAWING MACHINES

TO USE NOMOGRAM:

PLACE A STRAIGHT EDGE BETWEEN "NO. OF B&S GAGES" (A) AND "FINAL A.W.G. SIZE" (B). MARK POINT ON "REFERENCE LINE" (C). ADJUST STRAIGHT EDGE FROM THIS POINT ON "REFERENCE LINE" (C) TO "EXIT SPEED OF WIRE (DRAWING MACHINE) ~ FT./MIN." (D). READ "H.P. REQUIREMENT" (E). WHEN USING (B) SCALE I OR SCALE II, READ CORRESPONDING SCALE ON (E). A FACTOR OF 85% MACHINE EFFICIENCY HAS BEEN USED IN OBTAINING H.P. VALUES.

NOMOGRAM-B AL.



NOMOGRAM FOR CALCULATION OF HORSEPOWER REQUIREMENTS FOR EC-ALUMINUM WIRE

RULES:-

(1) DRAW FROM 3/8" ROD:- NO. OF B & S REDUCTIONS = EXIT GAGE SIZE + 1.

(2) DRAW FROM OTHER SIZES:- NO. OF B & S REDUCTIONS = EXIT GAGE - ENTRANCE GAGE.

DRAWN: F.P.F. JAN. 5, 1956 - W.J.O.

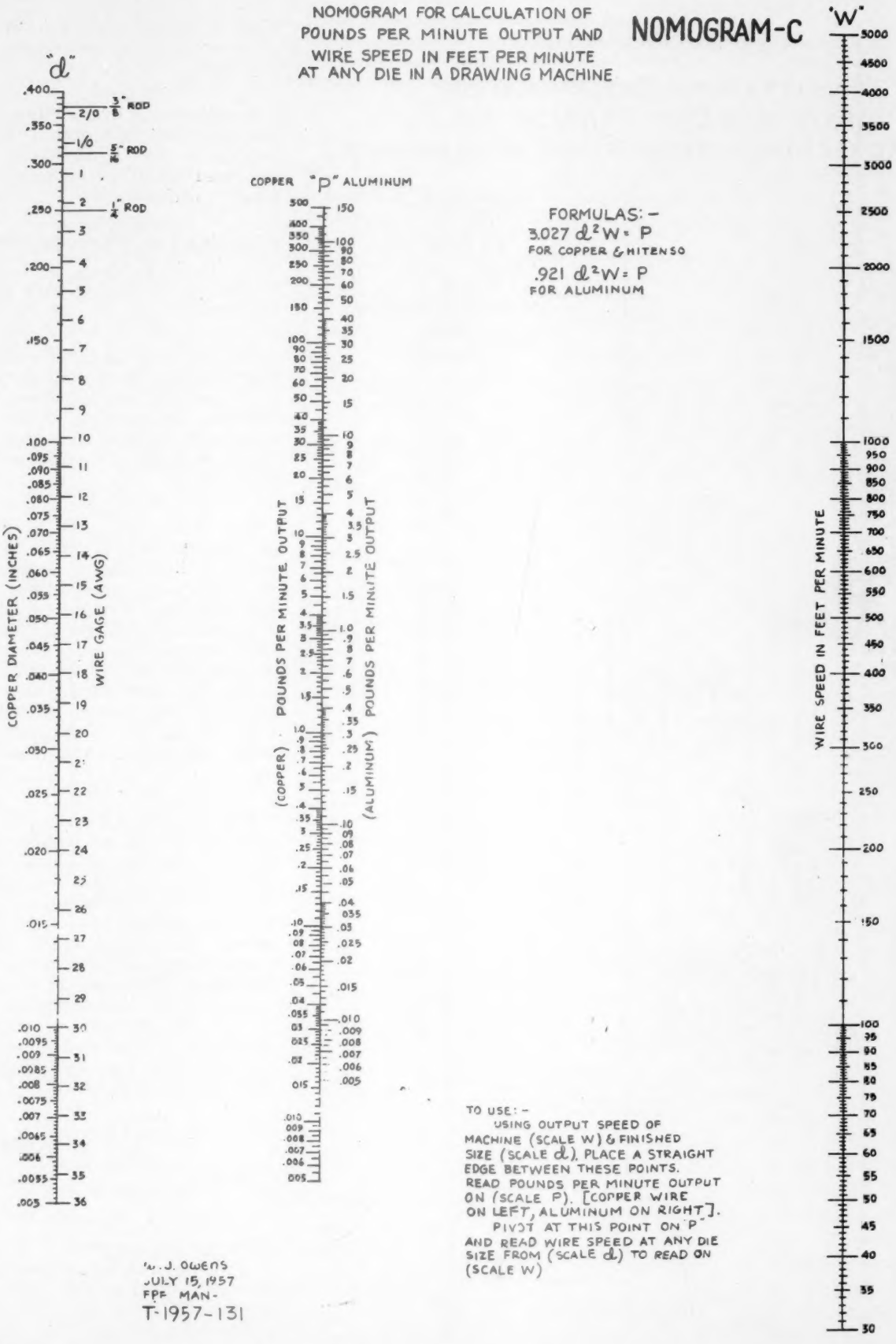
TO USE NOMOGRAM:

PLACE A STRAIGHT EDGE BETWEEN "NO. OF B & S GAGES" (A) AND "FINAL A.W.G. SIZE" (B). MARK POINT ON "REFERENCE LINE" (C). ADJUST STRAIGHT EDGE FROM THIS POINT ON "REFERENCE LINE" (C) TO "EXIT SPEED OF WIRE (DRAWING MACHINE) ~ FT./MIN." (D). READ "H.P. REQUIREMENT" (E). WHEN USING (B) SCALE I OR SCALE II, READ CORRESPONDING SCALE ON (E). A FACTOR OF 85% MACHINE EFFICIENCY HAS BEEN USED IN OBTAINING H.P. VALUES.

P-1956-3

NOMOGRAM FOR CALCULATION OF POUNDS PER MINUTE OUTPUT AND WIRE SPEED IN FEET PER MINUTE AT ANY DIE IN A DRAWING MACHINE

NOMOGRAM-C



FORMULAS: –

$3.027\ d^2W = P$

FOR COPPER & HITENSO

$.921\ d^2W = P$

FOR ALUMINUM

TO USE: –

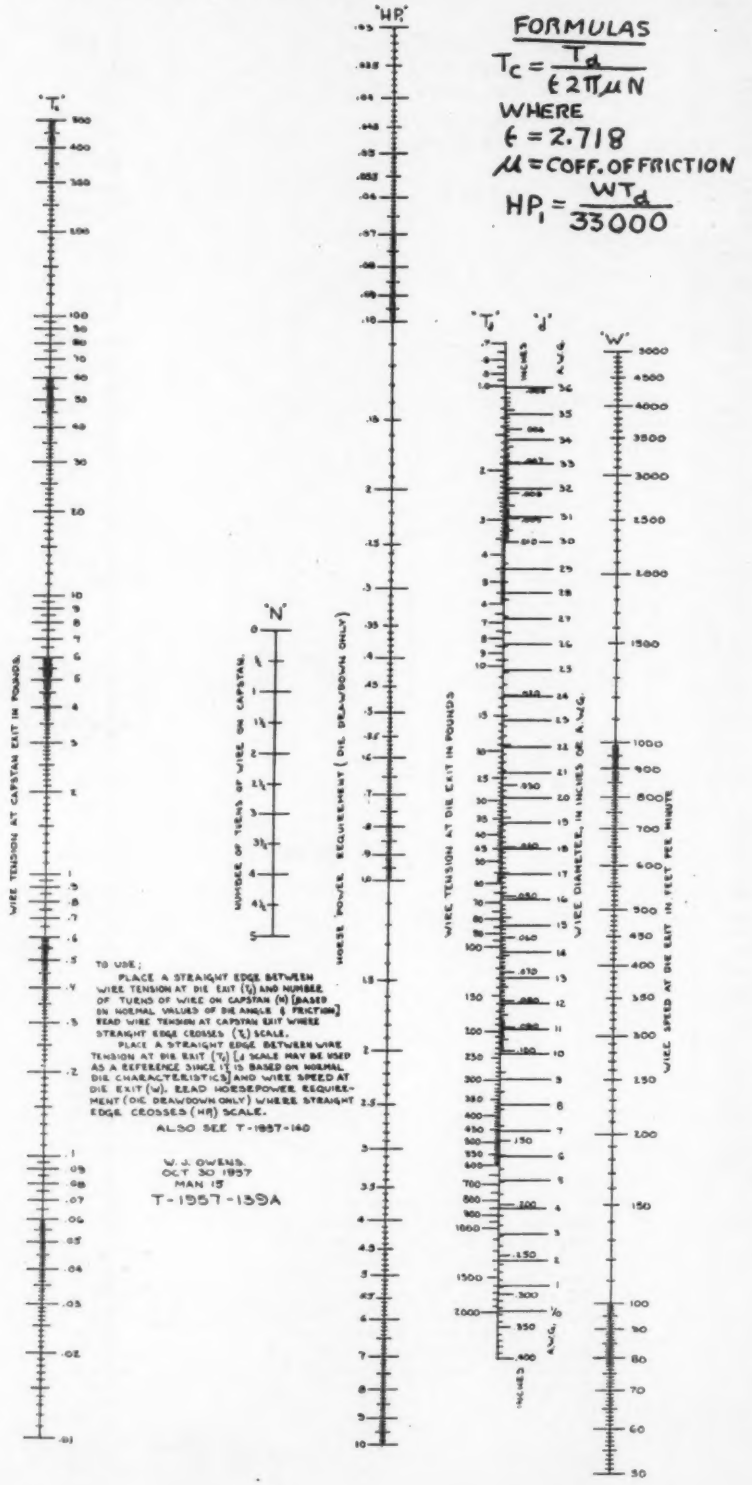
USING OUTPUT SPEED OF MACHINE (SCALE W) & FINISHED SIZE (SCALE d), PLACE A STRAIGHT EDGE BETWEEN THESE POINTS. READ POUNDS PER MINUTE OUTPUT ON (SCALE P). [COPPER WIRE ON LEFT, ALUMINUM ON RIGHT].

PIVOT AT THIS POINT ON "P" AND READ WIRE SPEED AT ANY DIE SIZE FROM (SCALE d) TO READ ON (SCALE W)

W. J. OWENS
JULY 15, 1957
FPE MAN-
T-1957-131

NOMOGRAM-D

NOMOGRAM FOR DETERMINATION OF CAPSTAN EXIT TENSION AND HORSEPOWER REQUIREMENT OF DRAWDOWN


FORMULAS
$T_c = \frac{T_d}{e^{2\pi\mu N}}$
WHERE
$e = 2.718$
μ = COFF. OF FRICTION
$HP_1 = \frac{WT_d}{33000}$
"T_c"
"HP"
"N"
"T_d"
"d"
"W"
WIRE TENSION AT CAPSTAN EXIT IN POUNDS
NUMBER OF TURNS OF WIRE ON CAPSTAN
HORSE POWER REQUIREMENT (DIE DRAWDOWN ONLY)
WIRE TENSION AT DIE EXIT IN POUNDS
WIRE DIAMETER, IN INCHES OR A.W.G.
WIRE SPEED AT DIE EXIT IN FEET PER MINUTE
TO USE;
PLACE A STRAIGHT EDGE BETWEEN WIRE TENSION AT DIE EXIT (T_d) AND NUMBER OF TURNS OF WIRE ON CAPSTAN (N) [BASED ON NORMAL VALUES OF DIE ANGLE & FRICTION] READ WIRE TENSION AT CAPSTAN EXIT WHERE STRAIGHT EDGE CROSSES (T_c) SCALE.
PLACE A STRAIGHT EDGE BETWEEN WIRE TENSION AT DIE EXIT (T_d) [d SCALE MAY BE USED AS A REFERENCE SINCE IT IS BASED ON NORMAL DIE CHARACTERISTICS] AND WIRE SPEED AT DIE EXIT (W). READ HORSEPOWER REQUIREMENT (DIE DRAWDOWN ONLY) WHERE STRAIGHT EDGE CROSSES (HP) SCALE.
ALSO SEE T-1957-140
W. J. OWENS
OCT. 30 1957
MAN 15
T-1957-139A

mine the values of die pull for an Awg reduction or one single die reduction.

★ ★ ★

Horsepower to Draw Wire—The die pull data determined from Nomogram "A" could readily be converted to hp per die by the simple calculation of:

$$\frac{\text{Formula (2)}\quad \text{Lbs. die pull} \times \text{FPM drawing speed}}{\text{33,000 Ft.-Lbs.}} = \text{hp per die}$$

or, the use of another scale on a nomogram.

★ ★ ★

Our next step would be to determine the horsepower requirement for a multiple die reduction; for instance, the drawing of an 18 Awg wire size from an 8 Awg entering wire size or 10 Awg reductions.

★ ★ ★

It is readily apparent that many calculations would normally be required to determine a summation of horsepower requirements for the foregoing stringup of dies. The speed in FPM and die pull at each die must be determined to progressively summarize total die horsepower from the 18 Awg finishing die back through the 8 Awg entry or 1st die. This approach would appear to be time consuming.

★ ★ ★

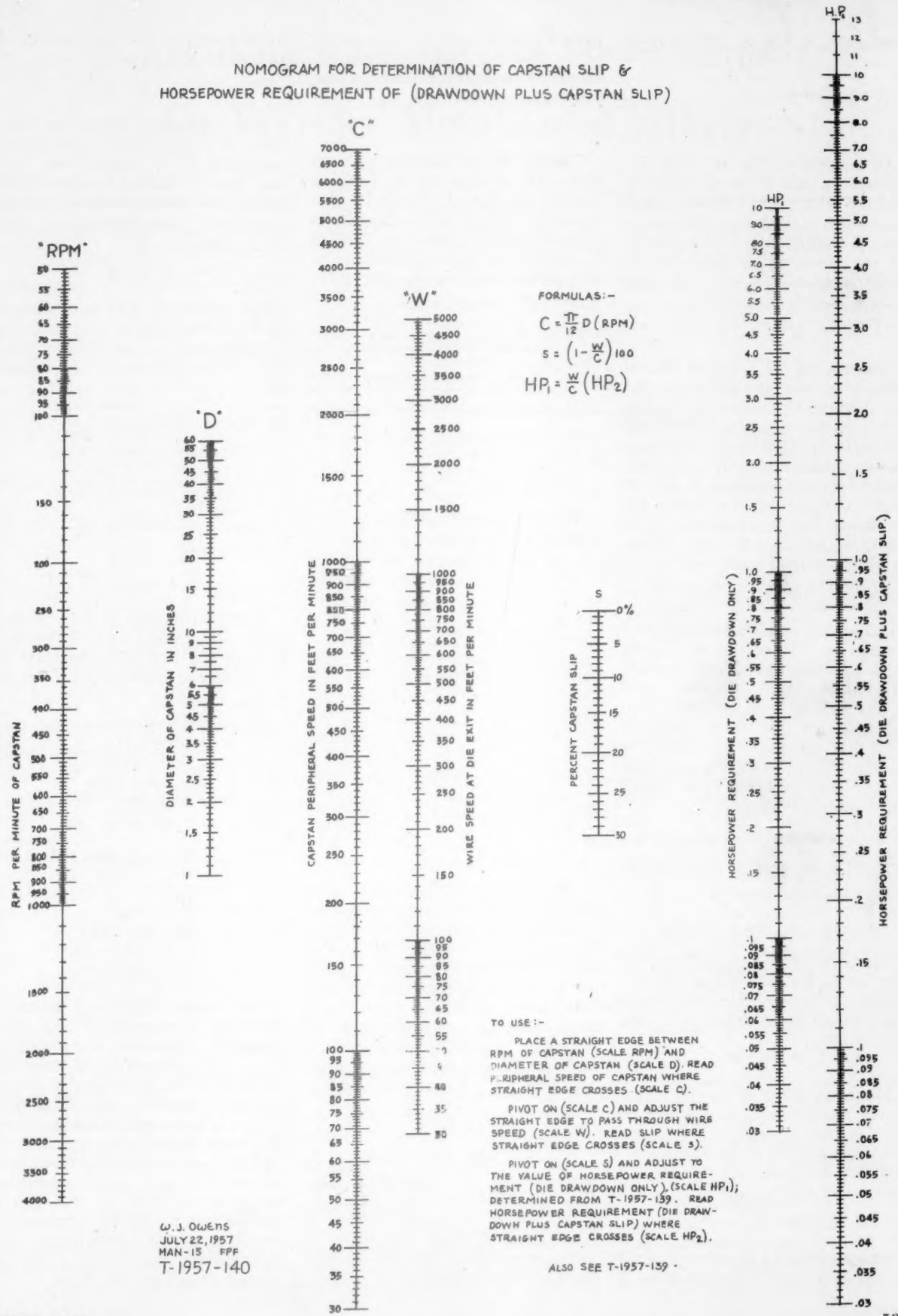
However, let us momentarily reexamine the hp per die Formula No. 2. As we progress back through our die stringup from the finishing die, the numerator of this formula remains constant. The pounds pull through each larger preceding die increases while the respective FPM speeds of wire decreases, with the result that the hp per each die (see Fig. No. 2) equals the hp required at the finish die. Hence, our total hp formula to draw wire becomes:

$$\text{Hp} = \frac{\text{Formula (3)}\quad \text{No of B\&S Reductions} \times \text{Die Pull (finish die)} \times \text{FPM (leaving fin. die)}}{\text{33,000 Ft.-Lbs.}}$$

★ ★ ★

We can now complete our 8 Awg to 18 Awg example, assuming a final wire speed of 4000 FPM and a finish (18 Awg) die pull of 44.6 lbs. with hard copper, then,

NOMOGRAM FOR DETERMINATION OF CAPSTAN SLIP & HORSEPOWER REQUIREMENT OF (DRAWDOWN PLUS CAPSTAN SLIP)



FORMULAS:-

$$C = \frac{\pi}{12} D\,(RPM)$$

$$S = \left(1 - \frac{W}{C}\right) 100$$

$$HP_1 = \frac{W}{C}\,(HP_2)$$

TO USE:-

PLACE A STRAIGHT EDGE BETWEEN RPM OF CAPSTAN (SCALE RPM) AND DIAMETER OF CAPSTAN (SCALE D). READ PERIPHERAL SPEED OF CAPSTAN WHERE STRAIGHT EDGE CROSSES (SCALE C).

PIVOT ON (SCALE C) AND ADJUST THE STRAIGHT EDGE TO PASS THROUGH WIRE SPEED (SCALE W). READ SLIP WHERE STRAIGHT EDGE CROSSES (SCALE S).

PIVOT ON (SCALE S) AND ADJUST TO THE VALUE OF HORSEPOWER REQUIREMENT (DIE DRAWDOWN ONLY), (SCALE HP_1); DETERMINED FROM T-1957-139. READ HORSEPOWER REQUIREMENT (DIE DRAWDOWN PLUS CAPSTAN SLIP) WHERE STRAIGHT EDGE CROSSES (SCALE HP_2).

ALSO SEE T-1957-139.

W. J. OWENS
JULY 22, 1957
MAN-15 FPF
T-1957-140

$$Hp = \frac{10 \times 44.6 \times 4000}{33{,}000} = 54 \text{ hp}$$

to draw wire only.

★ ★ ★

An approximation of total hp required in our slip-type drawing machine which will include power loss in the mechanics of the drive plus hp dissipated in friction (wire slip on capstans), is made by an allowance of 10-15% or, $1.10 \times 54 = 59.4$ hp total required.

★ ★ ★

Nomograms "B" cu and "B" al have been constructed from die pull Formula No. 1, and hp Formula No. 3, factoring in normal die and machine friction conditions. These nomograms are adequate where extreme accuracy is not required and serve as a ready approximation of hp requirements of slip-type machines for any string-up over a normal speed range.

★ ★ ★

Output in Pounds and Ft/ Min.— Nomogram "C" offers an equally quick tool for determining pounds per minute output and wire speed at any size die. It has been constructed from the basic formulae $3.027\ d^2W$ for copper and $.921\ d^2W$ for aluminum. These formulae are derived from weights/ft of copper and aluminum where:

d^2 = diameter of wire squared in inches

$\frac{\pi}{4} \times 12'' \times$ lbs/cu in. = a constant and

W = Wire Speed in F.P.M.

★ ★ ★

Analysis with Accuracy—Up to this point, we have discussed formulae and nomograms that enable the user to approximate the data sought.

★ ★ ★

For pinpointing values of horsepower required for losses due to friction more exacting formulae are expressed in Nomograms "D" and "E", for analyzing one die and capstan at a time.

★ ★ ★

These formulae were contributed in the May 1957 issue of **Wire & Wire Products** article "Mechanics of the Slipping Capstan" by **J. F. Stoltz** of **Western Electric Company, Inc.**

★ ★ ★

Capstan Wire Tensions—Nomogram "D" is based on the formula derived by Mr. J. F. Stoltz for snubbing tension of a wire on rotating capstan, where wire tension T_c leaving the capstan equals the die pull tension T_d divided by 2.718 to the $2^{\circ}\pi N\mu$ power.

(N = number of wraps and μ = coefficient of friction)

$$T_c = \frac{T_d \text{ (tension die pull)}}{\epsilon^{2\pi N\mu}} = \frac{T_d}{2.718^{6.283\mu N}}$$

★ ★ ★

This nomogram enables the user to determine values of pounds wire tension at capstan exit for a range of wire tensions T_d any material at die exit as related to the number of wraps on the capstan. For convenience of the copper processing engineer, Awg sizes "d" are plotted opposite the pounds die pull (under average conditions) required to draw copper through the die. In addition, the HP_1 scale and wire speed "W" scale provides a means of determining horsepower required for draw down through a range of die pulls T_d and speeds.

★ ★ ★

The engineer interested in conditions at each die and accompanying drawblock will find this type of Nomogram "D" extremely useful, and a valuable time saver. Data for a total stringup can be analyzed using this nomogram for a more accurate determination of values by examining requirements at each die and capstan and summarizing for total requirements.

★ ★ ★

Capstan Slip and Horsepower Requirement of Drawdown plus Capstan Slip—Referring again to J. F. Stoltz' discussion (Wire & Wire Products May 1957) on the slipping capstan, Nomogram "E" has been constructed from his formulae based on the relationship of capstan vs wire speeds.

★ ★ ★

This nomogram covers the relations of capstan RPM, diameter, peripheral FPM speeds, and percent slip as related to wire FPM speed to determine "die drawdown horsepower plus horsepower loss due to capstan slip".

★ ★ ★

The initial formula is expressed by J. F. Stoltz as power loss being a percentage of total input and "S" on Nomogram "E" is defined as,

$$S = \%\text{ loss} = \frac{\text{Power loss}}{\text{Power input}} \times 100$$

$$= \frac{\text{Capstan peripheral FPM} - \text{Wire FPM}}{\text{Capstan peripheral FPM}} \times 100$$

$$= \frac{C - W}{C} \times 100 = 1 - \frac{W}{C} \times 100$$

$$= \%\text{ Slip}$$

★ ★ ★

For the purposes of determining total horsepower, we have expanded Mr. Stoltz' speed relation to include a relation for horsepower, where,

HP_1 = Horsepower for die drawdown
HP_2 = Horsepower for die drawdown plus horsepower for capstan slip.
W = Wire speed FPM
C = Capstan speed FPM

★ ★ ★

We can then express ratios as,

$$\frac{HP_1}{HP_2} = \frac{W}{C}$$

$$HP_1 = \frac{W}{C} HP_2$$

★ ★ ★

As a result of the application of graphical computation to this series of formulae, the complete study of wire drawing machine characteristics is facilitated thereby encouraging a more thorough review when engineering decisions are to be made in the purchase of new or replacement of present wire drawing dies and machines. Graphical mathematics can also be applied effectively to innumerable problems where repetitive or complex calculations deduct from the engineer's productive time.

Alkaline Electrolytic De-Scaling Of Ferrous Metals and Alloys

This process, something new in the descaling of rod and wire, is of especial interest in that it eliminates the problems connected with the conventional method of scale removal. These are waste disposal, hydrogen embrittlement and acid attack.

Mills interested in learning more about the process may write to WIRE AND WIRE PRODUCTS, who will put the inquirer in direct touch with the inventor of this important development, designed to prepare wire rods for drawing.

"Alkaline Electrolytic De-Scaling" is unique in many respects. Unlike acid pickling, sodium hydride melts, shot blasting and the like, all of which resort to drastic measures and brute force, an EDS simply reduces the affinity of scale for steel to the point where the scale floats away of its own accord. The parent metal is neither attacked nor modified except for the reduction of its hydrogen content. The scale itself may be recovered in its original form from the tank sludge, or removed from the cleaning solution by simple filtration.

★ ★ ★

In this way even those forms of scale which defy removal by any method except shot or grit blasting, yield to the AEDS process and its moderate conditions (temperatures never in excess of 105°C (221°F.)). The cleaning solution acts mainly as a catalytic agent to assist the hydrogen gas released by the electric current in passing thru the phase boundary at the metal-water interface and as a vehicle to carry off the released scale.

★ ★ ★

The solutions themselves are non-toxic, non-corrosive to mild steel tanks and are not consumed to any degree in the process. In theory, except for drag-out losses, their life should be indefinite. In practice, the accumulation of scale and dirt interferes with their operation and they must be replaced. A typical solution comprises 30 parts of water, 4 of caustic soda and 5 of any of several amino-alcohols, whose cost (as of March 1, 1958) is about 25¢/lb., delivered in single drums to users plant or about 20¢/lb. in tank cars.

★ ★ ★

A contaminated solution may be run directly to the sewers where it is rapidly neutralized by the normal acidity of sewage or it may be destroyed by addition of cakes of "dry ice". After long exposure to the atmosphere with its carbon dioxide content, most of the alkali content will already be carbonated anyway; a condition that does not detract from its utility one jot.

★ ★ ★

The motivating energy for the process is derived from the low voltage, sixty cycle alternating current, which flows between the work and the tank electrodes, rendering the work first anode and then cathode. The use of A.C. in an electrolytic process of this sort has the advantage that power may be taken from the mains, transformed to a lower voltage by cheap and efficient means and used directly. A watt hour meter placed in the circuit could be used as the basis for billing royalties; power consumption being a function of the amount of scale removed and the mass (not the surface area) of the treated metal.

★ ★ ★

"Alkaline Electrolytic De-Scaling" is probably better suited to cleaning of steel wire than to any other ferrous metal product. Scale, rust and other corrosion products, the diverse coatings which film wire at different stages of manufacture, all of the former and many of the latter are easily, efficiently and cheaply removed. The cleaned surface is bright and retains its brightness against all but the most severe of corrosive conditions. On a continuous cleaning operation, altho thruput may be very great, the wire present in the cleaning tank is very small at any given moment, a condition which makes for small (compact) installations and relatively minor capital investment.

★ ★ ★

It is impossible to give any accurate estimate of costs until specific information regarding the proposed application is available. Spring steel wire can be cleaned in split seconds, high speed steel wire used to make twist drills may require as much as thirty seconds. 300 Series stainless wire is easy to descale, but 400 Series stainless is difficult, etc. As a general rule, cleaning by AEDS is much faster than pickling in sulfuric acid containing no inhibitor.

★ ★ ★

Aside from the de-scaling applications, the removal of occluded hydrogen imparts valuable characteristics to the treated metal. Rather than make claims on this score, it would be desirable for the prospective user to have tests run in his own laboratory by his own personnel. Among the properties tested, four are of particular importance; resistance to fatigue failure, to corrosion by moisture, amount of reduction possible in both single stage and stepwise drawing before annealing is required and tensile strength. Results of these tests will speak for themselves, in one way or another.

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This process is now available for licensing on an exclusive basis, with sole right to grant sublicenses being vested in the licensee, on a non-exclusive basis or otherwise.

★ ★ ★

The patent application has seen two actions by the patent examiner, the second action agreeing

(Please turn to page 586)

Wire Rolling and Forming Tool Applications

by Kenneth P. Lovdahl

Chicago, Illinois

The specialty shaping of wire (ferrous and non-ferrous) has grown to considerable tonnage as further processors fill the gap between mill production runs and orders of small quantity, special size or irregular shapes for such uses as strips for lamps, closet fixtures, toys, kitchen utensils, special fasteners, automotive and aircraft parts, lawn and household tools, oil well equipment, etc. The tooling problem involved is great as can be seen by the following cross sectional views: (See Figure 1).

FIG. 1 EXAMPLES OF SPECIAL SHAPES

These are a few of the thousands of special shapes which can be cold rolled out of round wire to very close tolerances. Most are used as rolled; however, the temper can be controlled by selection of raw material or intermediate annealing. Annealing, if done on the finished product, is usually done in an atmospherically controlled furnace to avoid scaling or smudge, usually a light skin or finish pass is necessary after the annealing operation to straighten out kinks and give some stiffness to the product.

★ ★ ★

While tungsten carbide forming tools make a fine product and give excellent production, the hazard of breakage is great and also the delivery is usually too long for the specialty mill. Therefore, it is advantageous to use a less expensive tooling material which is more readily available and which can be machined and ground in the ordinary tool room. However, the technique of producing these special tools must be developed in order to keep the cost per ton of product at a minimum.

Mr. Lovdahl has been a tool and die maker in the jobbing shops of Milwaukee, Plant Superintendent of Charter Wire, Inc., Milwaukee, Engineering Consultant on wire machinery development for Harper Mfg. Co., Maumee, Ohio, and Manager of the Precision Shaped Wire Div., National Lock Washer Co., Newark, N. J. In these capacities he developed tooling, machinery, methods and products for the wire industry.

In order to facilitate easy interchange of this tooling (in a two high rolling mill) it is advisable to use the feather key method for driving the work ring, one keyway being sufficient. Make sure the keyway has a fillet. (See Figure 2) However, in a case where a medium carbon or alloy shaft containing little or no chrome is used, or where a rolling ring of a tool steel not containing a good percentage of chrome is used, the shaft diameters and the bore of the ring should be chrome plated to prevent rust or corrosion (caused by the coolant liquid or condensation from temperature change), which would make the roll seize and cause some trouble in tool removal. the tools being slipped off the shaft, out the side of the machine. (See Fig. 2).

★ ★ ★

The most economical roll material is the Hollow Tool Steel bars which are available in various sizes and make for a minimum of machining to finished sizes and are readily available, making it unnecessary to stock-pile expensive roll materials.

★ ★ ★

A slip tolerance of from .002" to .004" should be allowed between the roll and roll shaft to assure trouble free removal. The thickness of the wire will not be affected by this allowance since the work pressure will force the clearance to the opposite side of the shaft. However, a great care must be exercised in the grinding operation to assure concentricity of the shaft diameters and also the inside diameter and outside diameter of the roll. The thickness of the wire will not vary any more than the total run-out of these diameters.

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The rolling operation is similar to an extruding operation. The wire actually comes out faster than it is going in due to the fact that most of the elongation is forward and causes a great deal of slip or wear on the roll surface.

★ ★ ★

The most satisfactory roll material has been found to be the high carbon, high chrome type, quenched in oil and given a double draw to 61-62 R/C, the second

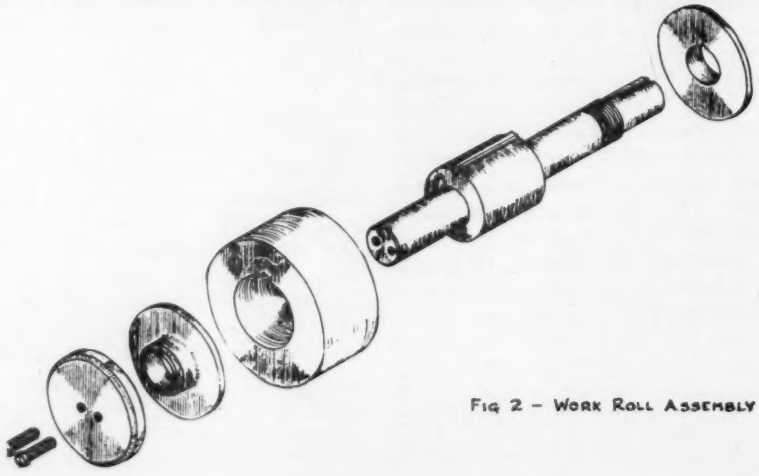

FIG 2 – WORK ROLL ASSEMBLY

draw being given after finish grinding. When given a high polish, these rolls will produce a high quality finish on the wire for excellent production runs. When producing shapes other than round edge flats, grooves are ground into the upper roll using the crush grinding method. Precision grooves can be reproduced in fifteen to twenty minutes in this manner. A floating mating lower roll is used to eliminate the necessity of precision machining for location laterally. (See Figure 3.)

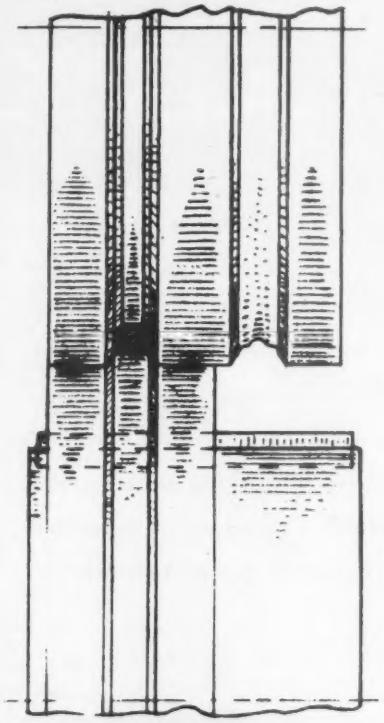

FIG. 3 TOOLING ASSEMBLY METHOD

At times it is necessary to grind 5/16 to 3/8 of an inch deep into the periphery of the roll, and the high carbon, high chrome type has depth of hardness which can stand such grinding without loss of hardness. Fast trouble free removal of this material depends upon proper selection of grinding wheels. It is unnecessary to rough machine the grooves before hardening since the crush grinding method is just as fast.

★ ★ ★

The best wheel found for crush grinding in this instance was 180 grit H grade vitrified bond and a ten to fifteen foot per minute work speed, the wheel hob being of a mild steel tubing and cyanide hardened after machining in an engine lathe, to exact size of shape desired. Immediately after hardening, three or four additional grooves are duplicated in the hob for future use. (See Figure 4).

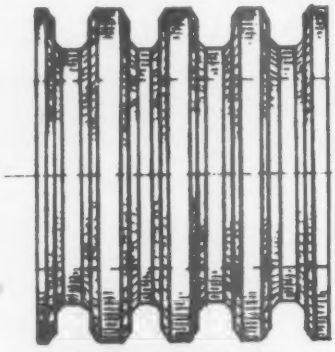

FIG. 4 GRINDING WHEEL CRUSH DRESSER

Under no circumstances should a resinoid bonded wheel be used for crush grinding since they do not form well and tend to burn or check the roll material. The hobbing method can be changed to suit the situation. If possible, slip the hob on the work shaft or work mandrel. The ideal hob diameter is approximately 1/5 of the grinding wheel diameter.

★ ★ ★

The best coolant found for this operation should be a light mineral transparent cutting oil (not water soluble) which will cling to the roll and follow through at the point of wheel contact. A disc type filter or magnetic separator should be used in the coolant system to eliminate scratches in the finished grind. The centrifugal coolant application has been used with some success. However, the attachments needed make wheel changing quite a task. When using this method, the wheel acts as though it were two or three grades harder and so must be compensated for.

★ ★ ★

Less expensive grades of tool steel can be used for some of these applications. However, there is the danger of "caving in" to the soft core. Should such a thing happen, the cost of labor and material replacement can be far greater than a small additional cost of original material. Therefore, it is advisable to analyze each job to determine the advisability of taking such a risk.

★ ★ ★

For wire rolling guides, it is desirable to have extreme hardness and wear resistance. Some progress has been made in this field by the ceramics industry, which can produce a very fine low cost product in volume. However, in the case of the smaller jobbing shop the best bet is still the high carbon, high chrome guide. Straightening rolls should be made out of a tool steel of a less expensive non-deforming quality so that they can be used as heat treated with perhaps a sizing grind in the bore for the bearing. (See Figure 5).

FIG. 5. STRAIGHTENER ROLL

Usually, the wire produced in the rolling operations described herein is sold in coils to the manufacturer who forms (bends or shapes) it into his product. Some modern plants are running tandem operations butt welding coils to furnish the customer with 1,000 lbs. and more of uninterrupted production. Automation is responsible for these advancements in the wire industry. The user looks to the wire converters for service, precision, new ideas, etc. in a good portion of its raw material requirements. The ingenuity of the shaped wire producer makes for low cost raw material of excellent quality.

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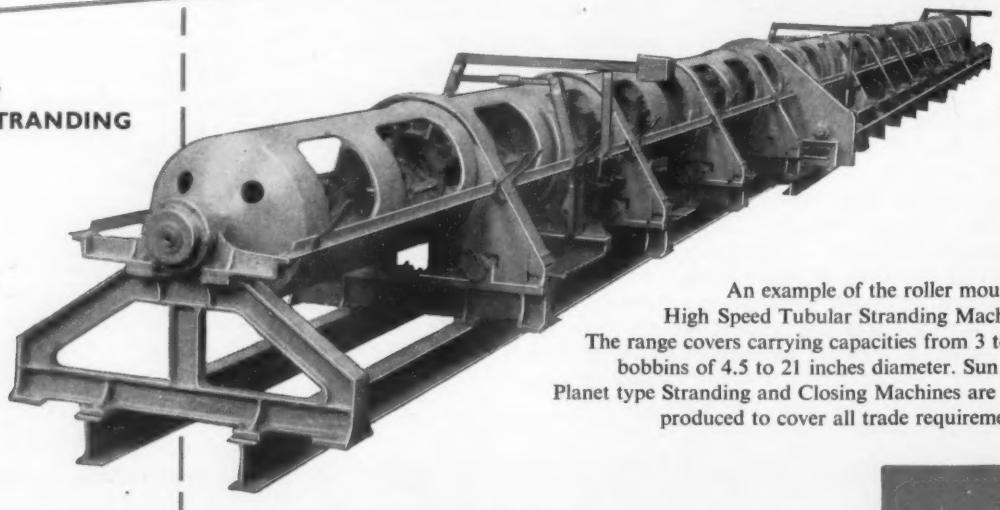
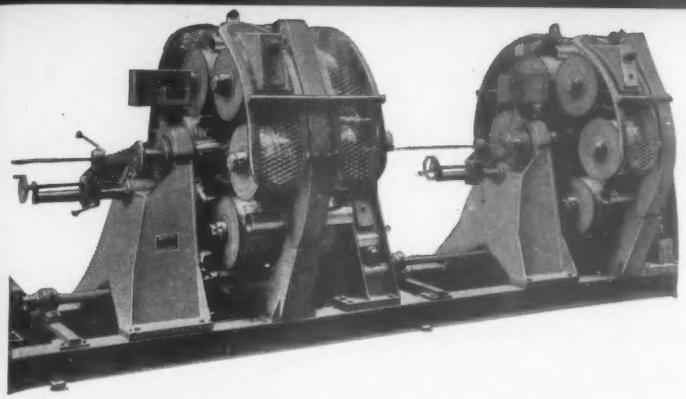
HIGH SPEED TUBULAR STRANDING MACHINE

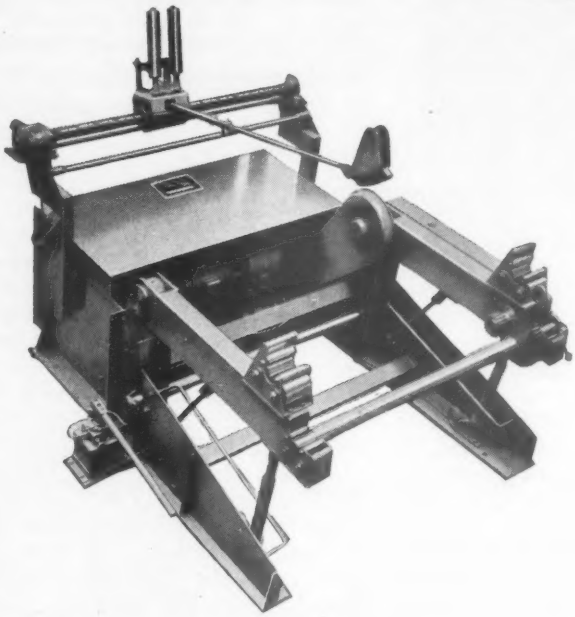


An example of the roller mounted High Speed Tubular Stranding Machine. The range covers carrying capacities from 3 to 45 bobbins of 4.5 to 21 inches diameter. Sun and Planet type Stranding and Closing Machines are also produced to cover all trade requirements.



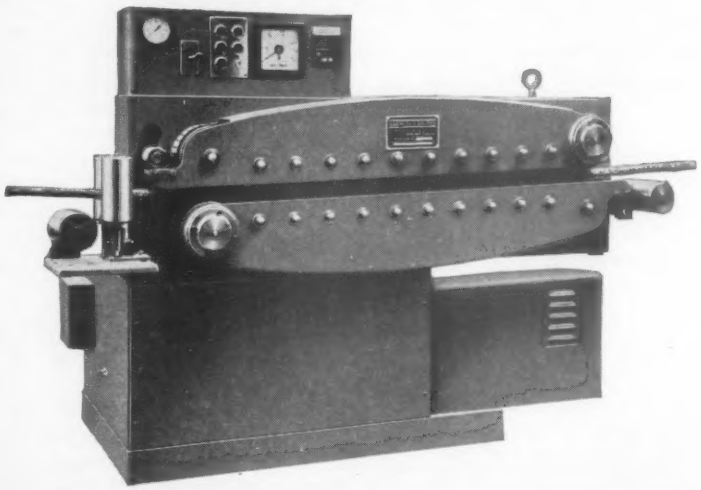
FIXED BOBBIN STRANDING MACHINE

The Larmuth & Bulmer Fixed Bobbin Stranding Machine produces high quality stranding at 50% higher speeds than the Sun and Planet method. Initial costs are low. Floor space is saved. Maintenance is reduced. Many automatic refinements are introduced.



INDEPENDENT TAKE-UP DRUM STAND

This Larmuth & Bulmer independent Take-up Drum Stand can be transported from one machine to another. A new traverse action automatically coils without the aid of the usual standby labour. Cable tension and stop mechanism is electrically controlled to dispense with the friction clutch method. Loading is eased by a hydraulic system.



CATERPILLAR HAUL-OFF

The Caterpillar Haul-Off uses endless belts of rubber shoes which fully protect the cable during haul-off. Grip may be pre-selected and simply controlled. It is positive and constant throughout operation. The unit does not require special foundations or the usual haul-off drum pit. It can be used as a reliable independent measuring device.

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Works: Todleben Works, Unwin Street, Salford 6, Lancashire, England

Electrical Testing

by Sam Kalifon
Product Engineer
Hatfield Wire and Cable Division
Continental Copper & Steel Industries, Inc.
Hillside, New Jersey

An elementary problem is electrical measurements is the determination of the value of a non-inductive resistance by means of an ammeter and a voltmeter. It is evident that these instruments can be hooked into the measuring circuit in either of two different ways, according to figures I and II, below.

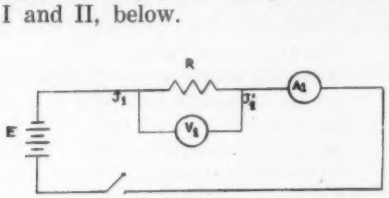

Figure I

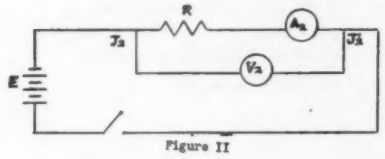

Figure II

In either method, the mere use of instruments results in the introduction of an error into the final determination and the objective now is to determine under what circumstances this error may be reduced to a minimum.

★ ★ ★

The basic difference in these circuits is that whereas in the first case the ammeter is connected in series with the paralleled resistance and voltmeter, in the second case the voltmeter is paralleled with the ammeter and resistance in series.

Figure I

Let V_1 be the voltmeter reading and A_1 the ammeter reading when the circuit switch is closed. At the junction J_1, the current A_1 divides into two portions, the larger of which flows through the resistance

Sam Kalifon

This article discusses a problem that while elementary, is good "refresher" material for the experienced cable engineer.

The author holds a Bachelor in Chemical Engineering degree received in 1943 from the Cooper Union Night School of Engineering.

R and the smaller of which flows through the voltmeter. At junction J'_1, the currents reunite and proceed to flow through the ammeter. Strictly speaking, then, the current read on the ammeter is greater than the current flowing through R by an amount equal to that which has been shunted through the voltmeter. Although the ammeter reading is wrong, the voltage drop across the resistance is accurately shown by the voltmeter since its value is the same regardless of which of the two alternate routes between J_1 and J'_1 the current follows. The value of resistance based on the readings observed is

$$R' = V_1/A_1 \qquad (1)$$

★ ★ ★

The correct value, however, is more properly expressed by

$$R = V_1/(A_1 - i) \qquad (2)$$

in which the denominator expresses the correct value of current through the resistance. The value of i is V_1/R_v, where R_v is the resistance of the voltmeter so that by substituting into (2), there is obtained

$$\begin{aligned} R &= V_1/(A_1 - V_1/R_v) \\ &= V_1/A_1(1 - V_1/A_1R_v) \\ &= R'/(1 - R'/R) \\ &= R'(1 + R'/R_v) \end{aligned}$$

R', as stated earlier, is the uncorrected value of the resistance being measured and the binominal $1+R'/R_v$ is the correction factor that must be applied to obtain the true value. The smaller the value assumed by the fraction R'/R_v, the smaller is the error introduced by the instruments. To put it another way, the smaller the resistance being measured compared with the voltmeter resistance the more accurate do the readings become. The criterion for accuracy, then, is:

USE THE HOOK-UP OF FIGURE I IF THE CURRENT IS LARGE FOR A SMALL VALUE OF E.

★ ★ ★

The small value of E is stipulated in order to insure that the large current is due to a low value of R rather than a high value of E.

Figure II

Let V_2 be the voltmeter reading and A_2 the ammeter reading when the circuit switch is closed. At the junction J_2, the current divides into two portions, the greater of which flows through the series combination of resistance and ammeter and the smaller of which flows through the voltmeter. At J'_2 these currents reunite but they do not at any time collectively flow

(*Please turn to page* 586)

Extrusion of Fast Curing Neoprene Wire and Cable Compounds

by
O. L. Simmons and C. E. McCormack
Elastomer Chemicals Department
Elastomer Laboratory
E. I. du Pont de Nemours & Company
Wilmington, Delaware

A paper presented at the Sixth Annual Wire and Cable Symposium of the Signal Corps at Asbury Park, N. J., on December 4, 1957.

Efficiency in the production of elastomer covered cables has received much attention during the past few years. New and improved factory lay-outs have resulted in more economical and uniform production. While much progress has been made, the search for improved manufacturing techniques is a continuing one, and it is reasonable to expect that further progress will be made in the years ahead.

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Considering the manufacture of neoprene covered wires and cables, it is readily evident that the curing operation presents opportunities for increased efficiency. Economies would result if it were possible to operate the continuous vulcanizing (CV) machines at higher speeds, and also if it were feasible to CV cure many of the large size cables currently being vulcanized by the more expensive lead press method. The first step in accomplishing this objective is the development of processing techniques which will permit the extrusion of very fast curing neoprene compounds. This paper presents information on attaining this objective.

New Processing Method

Normal methods of processing neoprene cable compounds involve exposing the accelerated compound to considerable heat before it reaches the extrusion machine. This results from the practice of adding the accelerators either in an internal mixer or on a mill, and then storing the mixed compound for a variable period of time before extrusion. The degree of heat exposure is subject to normal factory variations as well as to climatic conditions. Of necessity, the cable compounder must adjust his compounds to withstand the worst combination of conditions without scorching or precuring.

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The method of processing described in this paper involves withholding the accelerators from the compound until the extrusion operation. As a result, the accelerated compound is exposed to a minimum of heat, thus making it practical to use faster curing compounds without danger of scorching. Specifically, the method consists of chopping the unaccelerated neoprene compound into small pellets, blending these in a tumbler with pellets of accelerator masterbatch, and then feeding this blend into the extruder.

★ ★ ★

Obviously there are other methods of adding accelerators at the extruder that may be of use for special processing conditions. For example, it is highly possible that good results would be obtained by feeding the extruder with a combination strip, consisting of a layer of unaccelerated neoprene compound and a layer of accelerator masterbatch. An oil dispersion of accelerator could also be injected into the barrel chamber of the extruder. As yet these methods have not been fully investigated.

Accelerators

To qualify for use in fast curing neoprene cable compounds, an accelerator must possess many properties in addition to accelerating the rate of cure. Among these are (1) freedom from toxicity (2) no impairment of the electrical properties of the neoprene or the insulation in direct contact with the neoprene (3) dispersibility (4) no harmful effect on aging and (5) no effect on water absorption.

★ ★ ★

Of the many accelerators which have been investigated, only NA-22, (2-mercaptoimidazoline) and Permalux (di-ortho-tolylguanidine salt of dicatechol borate) were found to meet all of the requirements. These accelerators are well known to cable manufacturers since they have been used for many years in neoprene compounding. By using them in combination and in higher than customary amounts, very fast cures can be obtained.

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Notable among the accelerators which possessed all but one of the required properties are diethylthiourea, and p-tertiary-butyl catechol. Diethylthiourea, a relatively low cost material, was deficient only in that it impaired electrical properties. In view of its low cost and excellent activity, it should be considered for use in neoprene jackets on shielded cable or in constructions which have an impermeable separator such as Mylar* polyester film. P-tertiary-butyl catechol was acceptable in

* Registered Trademark of E. I. du Pont de Nemours and Co., Inc.

all respects except that it was considered to be somewhat toxic for factory handling.

Preparation for Extrusion

Experiments have shown that optimum dispersion results when the accelerators are added to the extruder in masterbatch form. This is especially true of accelerators such as NA-22 and Permalux which have melting points above extrusion temperatures. A typical accelerator masterbatch, utilizing SBR, an elastomer inert to the neoprene accelerators, is as follows:

ACCELERATOR MASTERBATCH	
SBR-1503	100.0
NA-22	67.7
Permalux	33.3
Light Process Oil	20.0

★ ★ ★

For efficient dispersion in the extruder, the accelerator masterbatch should have a viscosity no greater than that of the unaccelerated base compound.

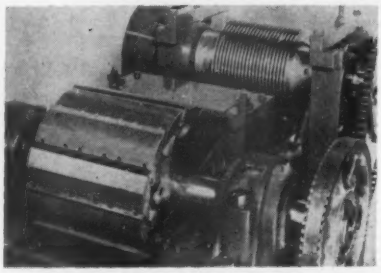
★ ★ ★

Accelerators which melt at extrusion temperatures are dispersed satisfactorily in the extruder when applied as a surface coating on the pellets of base compound. An example of such an accelerator is diethylthiourea which melts at 77°C. A uniform accelerator coating is obtained by first applying a small amount of oil to the base compound pellets in a tumbler, following with the accelerator addition. The oil serves as a carrier for the powdered accelerator and promotes uniform coating. Experimental results using this technique are shown later in the paper.

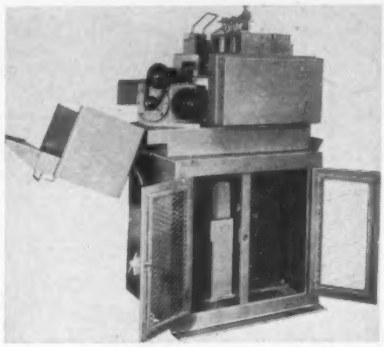
★ ★ ★

There are several possible methods of reducing neoprene compounds to a suitable pellet size. Trial runs have been successful with chopping machines manufactured by Taylor - Stiles Company of Riegelsville, New Jersey, and Cumberland Engineering Corporation of Pawtucket, Rhode Island. Photographs of these machines are shown in Figure I. The Taylor - Stiles machine will handle a 15″ ribbon feed at a rate of 50 feet per minute. It first slices the ribbon into ⅜″ strips and then chops the strips into lengths of ¼″ or less. This machine has a positive cutting action and should be satisfactory for handling even very soft stocks on a production basis. The Cumberland machines operate on a somewhat different principle. In one shearing operation, they remove pellets from the feed strip. The mechanism consists of a rotating drum with four stair-step notched blades and a similarly notched bedknife. Cumberland builds two machines, one accommodating a 7″ feed strip and the other a 14″ width. Both machines will handle 70 to 90 feet per minute.

Figure I
PELLETIZING EQUIPMENT



Taylor-Stiles Co. — Chopping Machine.



Cumberland 7″ Stair-Step Dicing Machine.

★ ★ ★

Experience has shown that pellet size is not critical. Good results have been obtained with ¼″ cubes and also pellets measuring ¼″ x ¼″ x ½″. To prevent massing of the pellets they should be coated with talc as they are discharged from the pelletizer.

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Blending accelerator masterbatch pellets with base compound pellets is a relatively simple operation. Excellent blending results from tumbling in a concrete mixer for two to three minutes. There is little question a high efficiency continuous tumbling operation could be devised for large scale production.

Extrusion

The success of adding accelerators at the extruder is dependent on the extruder doing a satisfactory mixing job. Several extruder set-ups have been investigated. The two screws used in our laboratory investigation are described in Table I. One is a so-called rubber screw and the other a type of plastics screw. The results obtained with each of these screws applying a typical neoprene compound in a 3/64″ wall on a #12 aluminum conductor are shown in Table II. In each case a 30 mesh screen was used in the head of the extruder. It will be seen that both extruder set-ups gave comparable results.

Table I
NO. 1 ROYLE EXTRUDER SCREWS

RUBBER SCREW

1. Royle No. AY000298
2. OD 1.994″
3. Root Diameter, Feed and Discharge Ends—1.125″
4. Length 21.18″
5. No. of Flights—Double
6. Compression Ratio—1.74
7. Pitch of Screw: Feed End—24°40′; Discharge End—16°14′
8. Land width—0.18″

PLASTICS SCREW

1. Royle No. AY00024
2. OD 1.994″
3. Root Diameter, Feed End—1.25″; Discharge End—1.81″
4. Length 21.18″
5. No. of Flights—Single
6. Compression Ratio—3.84
7. Pitch of Screw: Feed End—25°30′; Discharge End—25°30′
8. Land width—0.18″

The extruders now being used by the cable industry for handling cold feed are ideally suited for thorough blending of pellet stock.

TABLE II

EFFECT OF SCREW DESIGN ON PHYSICAL PROPERTIES

Cure: 150 psi steam

Modulus at 200% Elongation, psi	Rubber Screw	Plastics Screw
10 seconds	1100	1050
15 "	1575	1500
20 "	1800	1650
30 "	1850	1900
45 "	2000	2000
60 "	2050	2175
90 "	2100	2300
Tensile Strength, psi		
10 seconds	1625	1600
15 "	2150	2075
20 "	2300	2300
30 "	2400	2450
45 "	2450	2500
60 "	2500	2550
90 "	2500	2600
Elongation at Break, %		
10 seconds	420	420
15 "	400	380
20 "	370	360
30 "	340	360
45 "	330	295
60 "	300	280
90 "	280	270
Permanent Set - ASTM D-470		
10 seconds	0.19	0.18
20 "	0.13	0.11
30 "	0.13	0.12

These machines have a double extended barrel and usually operate with screws with a 3 to 1 compression ratio. It is also customary to use a 30 mesh screen in the head. Several successful factory trials have been made in machines of this type.

Experimental Results

A set of experiments was run in our laboratory to compare conventional methods of extrusion with the pellet feed method. The control compounds A and C shown in Table III were completely mixed before feeding the extruder. A strip feed was used with these compounds. Compounds B and D were fed into the extruder as a blend of base compound and accelerator masterbatch pellets. In all cases the plastics screw described in Table I was used, as well as a 30 mesh screen in the extruder head. All compounds were applied as a 3/64" wall on a #12 aluminum conductor. The insulated wires were thoroughly cooled immediately after extrusion. Cures were then made in a quick opening steam vulcanizer operating at 150 psi steam pressure. The vulcanizer shown in Figure 2 consisted of a 12' vertical tube with cold water in the bottom half. During cure the specimens were suspended on a rack in the upper half of the tube containing steam. At the specified curing time, the rack was released so that it fell to the bottom of the tube. In this way the specimens were cooled under pressure in a manner similar to factory CV machines. A pressure of 150 psi was deliberately chosen rather than the usual factory pressure of 200 to 250 psi, in order to more nearly simulate the actual neoprene temperatures occurring when large size cables are cured in the factory.

★ ★ ★

Cures were also made in a 100°C. circulating air oven. The physical tests obtained with both methods of cure are shown in Figures 3, 4, 5 and 6.

FIGURE II

HIGH PRESSURE STEAM VULCANIZER (SCHEMATIC)

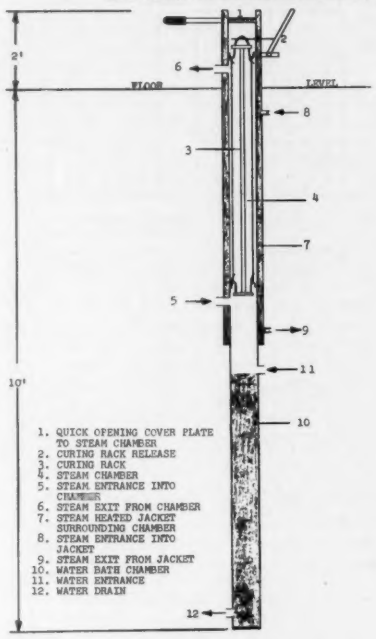
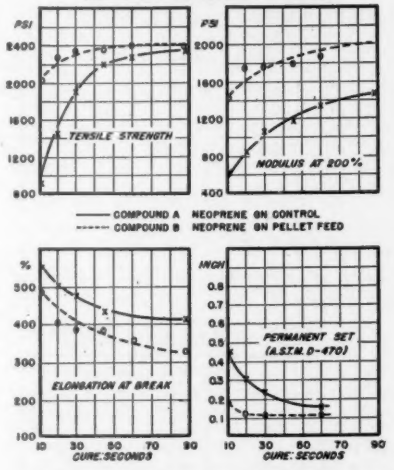


FIGURE III

CURE: 150 PSI STEAM — TYPE GN



A separate study using the conditions described above shows the results obtained with a surface coating of diethylthiourea. The compounds used are described in

TABLE III

Control Compound A		Control Compound C	
Neoprene Type CN-A	100.00	Neoprene Type W	100.00
SBR-1503	3.00	SBR-1503	3.00
AKROFLEX CD	2.00	AKROFLEX CD	2.00
Magnesium Oxide	4.00	Magnesium Oxide	4.00
SRF Carbon Black	20.00	SRF Carbon Black	20.00
FEF Carbon Black	20.00	FEF Carbon Black	20.00
Hard Clay	50.00	Hard Clay	50.00
HELIOZONE	3.00	HELIOZONE	3.00
Light Process Oil	12.60	Light Process Oil	12.60
Petrolatum	2.00	Petrolatum	2.00
Zinc Oxide	5.00	Zinc Oxide	5.00
NA-22	0.75	NA-22	0.75
	222.35		222.35

Pellet Compound B			Pellet Compound D	
Neoprene Type GN-A	100.00		Neoprene Type W	100.00
AKROFLEX CD	2.00		AKROFLEX CD	2.00
Magnesium Oxide	4.00		Magnesium Oxide	4.00
SRF Carbon Black	20.00		SRF Carbon Black	20.00
FEF Carbon Black	20.00	X	FEF Carbon Black	20.00 X
Hard Clay	50.00		Hard Clay	50.00
HELIOZONE	3.00		HELIOZONE	3.00
Light Process Oil	12.00		Light Process Oil	12.00
Petrolatum	2.00		Petrolatum	2.00
Zinc Oxide	5.00		Zinc Oxide	5.00
SBR-1503	3.00		SBR-1503	3.00
NA-22	2.00	Y	NA-22	2.00 Y
PERMALUX	1.00		PERMALUX	1.00
Light Process Oil	0.60		Light Process Oil	0.60
	224.60			224.60

X - Base Compound Pellets

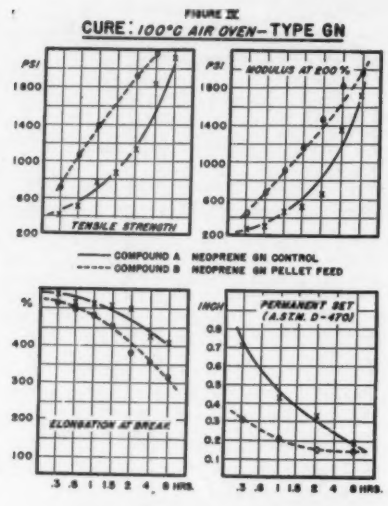
Y - Accelerator Masterbatch Pellets

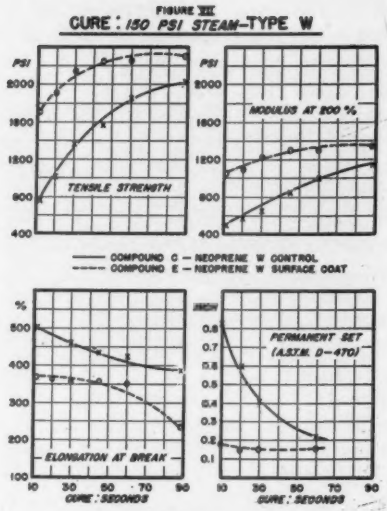
TABLE IV

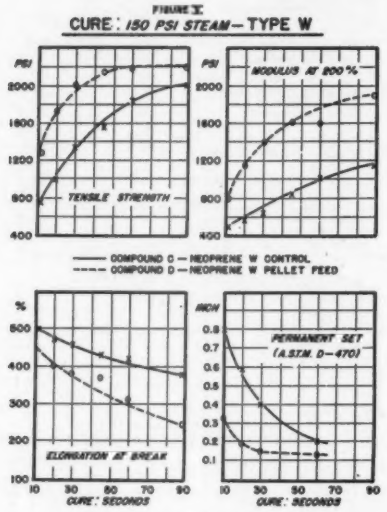
Control Compound C		Surface Coated Compound E	
Neoprene Type W	100.00	Neoprene Type W	100.00
SBR-1503	3.00	AKROFLEX CD	2.00
AKROFLEX CD	2.00	Magnesium Oxide	4.00
SRF Carbon Black	20.00	SRF Carbon Black	20.00
FEF Carbon Black	20.00	FEF Carbon Black	20.00 X
Magnesium Oxide	4.00	Hard Clay	50.00
Hard Clay	50.00	HELIOZONE	3.00
HELIOZONE	3.00	Light Process Oil	12.00
Light Process Oil	12.60	Petrolatum	2.00
Petrolatum	2.00	Zinc Oxide	5.00
Zinc Oxide	5.00		
NA-22	0.75	Diethylthiourea	4.00 Y
	222.35	Light Process Oil	2.00
			224.00

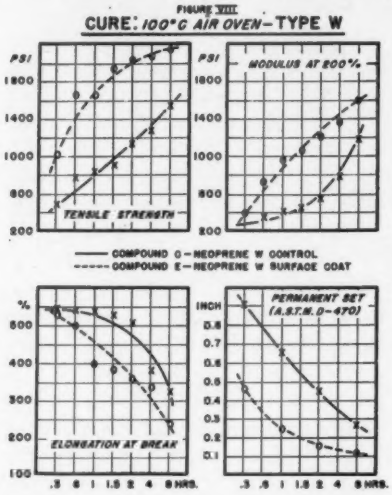
X - Base Compound Pellets

Y - Surface Coating









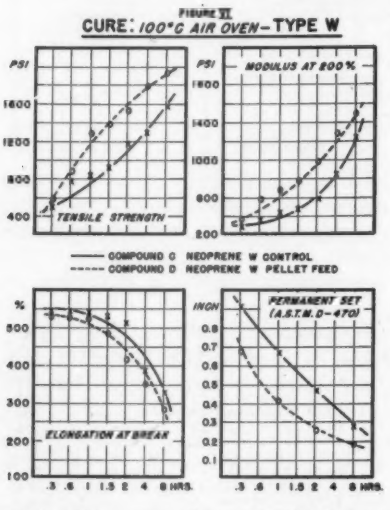


Table IV, and the physical test results in Figures 7 and 8.

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It is evident from a study of the physical test data that good dispersion was obtained with pellet feed under the conditions of these experiments. The curves show exceptionally fast rates of cure for the highly accelerated pellet feed compounds.

★ ★ ★

Aging studies were made on all of these compounds. After four days in the oxygen bomb at 70°C. and 300 psi pressure, and after seven days in a circulating 70°C. oven, the test results on the highly accelerated pellet feed compounds were equivalent to the results obtained on the control compounds, as judged by per cent retention of tensile strength and elongation.

Factory Trials

Several successful factory trial runs have been made, ranging from short runs using 50 pounds of material to longer runs of 300 pounds. Extruder sizes have varied from 2″ to 6″ in diameter. Both single and double extended barrels have been used. Screw compression ratios have varied from 2/1 to 3.5/1. In some cases, the wire was CV cured, while in others involving the application of neoprene over plastics, oven cures were employed.

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Optimum results are obtained with double extended machines, having a screw compression ratio of about 3/1. Obviously, machines with shorter barrels or with screws of a lower compression ratio perform less blending of the stock. There is evidence, however, that this can be partially compensated for by the use of screens to induce additional back pressure.

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In a typical factory run, a 20 mil neoprene jacket, similar to Compound B, was CV cured over a 3/64″ SBR insulated #12 AWG conductor. With the fast curing compound the CV speed was increased to 300 ft/minute from a normal 150 ft/minute. At 300 ft/minute, the neoprene jacket was well cured. Much faster speeds, although not tried, were definitely indicated.

Practical Applications

Since the addition of accelerators at the extruder minimizes the heat to which the accelerated compound is exposed, it is possible to use a higher accelerator level, resulting in faster curing speeds. This technique of processing neoprene compounds should be of interest in the following.

(a) Faster CV speeds — resulting in economy of operation and greater output for a given capital investment.

(b) Replacement of the lead press cure in some cases—faster curing should make for practical speeds for large cables and the quick surface cure should reduce damage to the cable due to scraping on the bottom of the tube.

(c) Low temperature CV cures — shielded cables and oil filled cables can be cured at reasonable speeds at lower temperatures.

(d) Application over plastics — the greater curing speed should make for more practical curing times at temperatures below the flow point of the plastics.

A New Instrument for Precise Measurement of Fine Wire Diameters

by Leo Walter
Consulting Engineer
Painswick, England

In this article Mr. Walter describes an instrument that has especial value wherever the determination of the exact diameter of a wire is an important consideration.

Equipment has been developed in the National Physical Laboratory in Great Britain to provide a means of measuring fine wire up to about 0.01 in. (0.25 mm.) in diameter to an accuracy of ± 0.00001 in. (0.25μ) or better, in which "μ" is a symbol for microns. A principal feature of the design is the use of a very light contact load at the measuring anvils so that when the wire is of very small diameter, or of soft material, errors of measurement due to compression of the wire are reduced to a minimum.

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Fig. 1 illustrates diagrammatically the principal of operation used. The wire to be measured

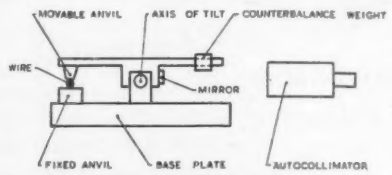

Fig. 1—Principle of operation used. * * *

lies with its axis horizontal between two anvils, one fixed and the other movable. The fixed anvil is attached to the base plate of the apparatus and the movable anvil to a balanced beam which can tilt about a horizontal axis. Attached to the beam is a small plane mirror which may be viewed by an appropriately placed autocollimator. The angle of tilt of the beam, and therefore of the mirror, varies with the diameter of the wire between the anvils. Variations in this angle are measured by means of the autocollimator and the distance from the centre of the movable anvil to the axis of tilt of the beam is such that a change in diameter of 0.000,005 in. (0.125μ) gives rise to a change in angle of 1 second of arc. The autocollimator readily detects a change of this magnitude.

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The construction of the apparatus is shown in Fig. 2. The upper

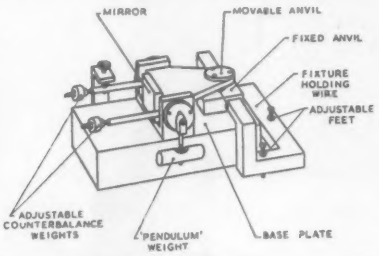

Fig. 2—Construction of test apparatus for fine wire measurement. * * * * * * *

surface of the hardened steel base plate is lapped so that slip gauges, which form the lower (fixed) anvil, may conveniently be wrung to it. Attached to the base is a steel U-piece in which are mounted the selected precision ball bearings which form the pivot for the tilting beam. The ball bearings are mounted in such a manner that they are slightly loaded axially so as to take up any play which may be present in the races. The tilting beam carries the movable anvil at one end, the actual contact face being a lapped flat of circular outline 0.05 in. (1.25 mm) in diameter. The other end of the beam consists of two rods threaded over a portion of their lengths. On to each of these rods screws a cylindrical weight and by moving the weights along the rods the balance of the beam, and thus the contact load at the anvils, may be closely adjusted, the weights being then fixed in any desired position by means of locknuts. The mirror is fixed to the beam in a position between the threaded rods as shown. Mounted on the base is a bracket carrying a knurled screw which when screwed inwards bears down on one of the rods. The anvil may thus be raised or lowered by turning the screw in the appropriate direction.

★ ★ ★

The ends of the spindle carrying the beam in the ball bearings pass completely through the inner races and protrude outside the U-piece. Rigidly attached to these ends are arms which hang downwards and carry "pendulum" weights. These weights may be

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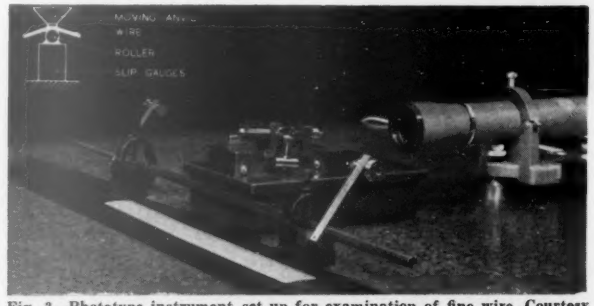
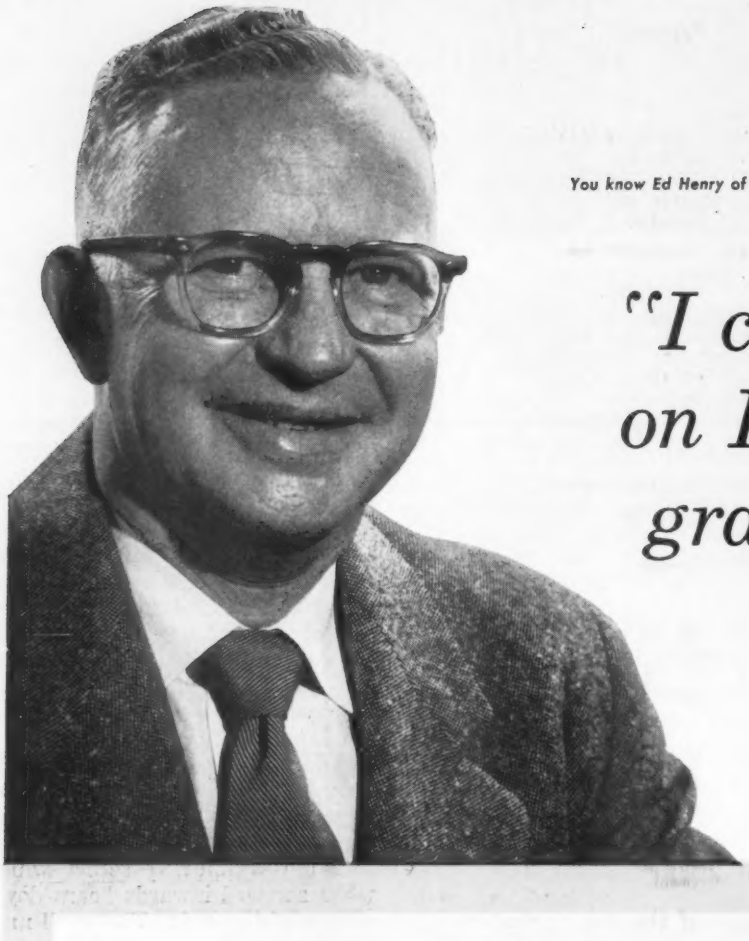


Fig. 3—Phototype instrument set up for examination of fine wire. Courtesy of National Physical Laboratory (Crown copyright reserved). * * *



You know Ed Henry of Hedalloy Die Corporation. He says . . .

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The inset illustration shows the world's largest boltmaker die, made by Hedalloy Die Corporation—one foot long and nearly seven inches in diameter! Because a single scratch during finishing would mean a loss of countless hours of work, Hedalloy specified Elgin Precision Graded DYMO-C* . . . to be sure.

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Torque Values of Spring Wire Recorded

This is a summary of a Technical Report prepared by the NBS on the effect of metallurgical variables on the properties of spring wire.

The National Bureau of Standards, in work sponsored by the Army Ordnance Corps, Springfield Armory, has been investigating the effect of metallurgical variables on the properties of spring wire. Because the wire from which helical extension or compression springs is wound is stressed in torsion, a means was sought for measuring the torsional properties easily and accurately. Consequently, an apparatus was constructed that automatically records the torque-twist characteristics of wire less than 0.05 in. in diameter.

★ ★ ★

Designed by **H C. Burnett** and **J. A. Bennett** of the mechanical metallurgy laboratory, the equipment provides a rapid, easy method for determining the torsional properties of small-diameter wire. The spark recording system utilized is entirely frictionless so that even small torque values can be recorded accurately. The apparatus should be of general utility in developing more significant specifications for the spring wire used in many types of ordnance items.

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The method of making the measurements is to couple the test wire in series with a larger-diameter calibrated wire and to rotate one end of the assembly. The twist in the calibrated wire is a measure of the torque and is recorded on one axis of a chart, while the twist in the test wire is recorded along the other axis.

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The framework of the device is a table with two shelves clamped to the legs. A small motor and reduction gear are mounted on the table surface. The wire undergoing test, cut to a length of approximately 6½ in., is suspended from a coupling attached to the motor's drive shaft which extends through an opening in the table surface.

★ ★ ★

The bottom end of the test wire is coupled, through an opening in the middle shelf, with the measuring wire which is of larger diameter and about three times as long as the test wire. The measuring wire is held in a coupling keyed to the bottom shelf, and is spring loaded to provide a small amount of tension to both wires. To eliminate oscillations, an inverted damping cup, immersed in a pan of light oil, is fastened to the coupling at the bottom of the test wire.

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A fixed helical electrode is mounted on the middle shelf. Fitted vertically inside the fixed electrode is a movable bar electrode supported by the coupling between the two wires. A cylinder of heat-sensitive paper, on which the torque-twist measurements are recorded, is taped firmly around a disk attached to the top of the test wire. This paper cylinder, scaled at appropriate torque and twist values, hangs suspended between the movable bar electrode and the fixed helical electrode without touching either one. Both of the electrodes are designed with a knife edge so that the position of the spark locates accurately the point where the electrodes are closest together.

(*Please turn to page* 585)

Figure 1.—Machine developed at the NBS to record the torsional properties of small-diameter wire. A damping cup is being placed around the measuring wire. Motor and reduction gear assembly are mounted on the top shelf. Cylinder of heat-sensitive paper has been partially cut away to show the movable bar electrode behind the test wire suspended from a coupling. The fixed helical electrode, mounted on the middle shelf, fits around the paper cylinder. Recording is accomplished by a spark jumping from the helical electrode on the outside of the paper cylinder to the movable bar electrode on the inside.

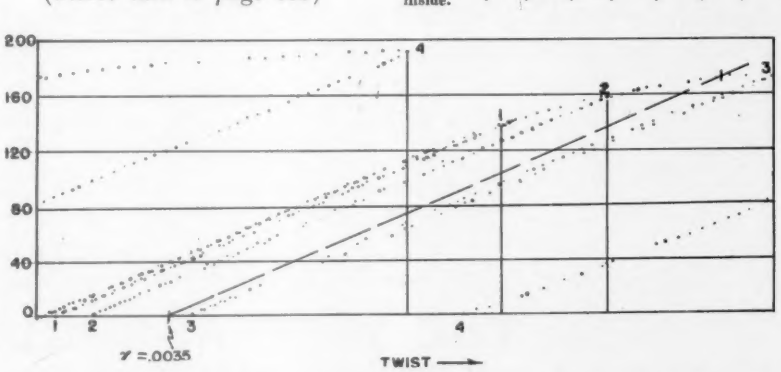


Figure 2.—Record of the torsional characteristics of oil-tempered wire, 0.039 in. in diameter. The load is shown on the ordinate as nominal surface shear stress, 1000 lb./in.² During this test, the test wire was alternately loaded and unloaded four times. The numbers 1 through 4 on the curves indicate the peak stress of each cycle. The numbers 1 through 4 along the base locate the total permanent set resulting from the corresponding cycles. The yield strength is determined at a shear strain offset of 0.0035.

CALIFORNIA IN JUNE . . .

A Good Place for a Wire Man!

The Annual West Coast Regional Meeting In 1958 Will Be Held At The Statler Hotel, June 5 and 6, Los Angeles, Calif.

The Program

THURSDAY, JUNE 5th

10:00 A.M. to 2:00 P.M.—Registration, Garden Room.

2:00 P.M. to 5:00 P.M.—Technical Sessions, Garden Room.

"The Large Pay-Off Package"—The speakers are:
E. Jefferson Crum, R. H. Miller Co., Riderwood, Md.
Robert W. Davis, President, K-Lath Corp., Alhambra, Calif.

"Problems of the Wire Fabricators"—Speakers will be:
William Gardner, Gardner Clark Spring Co., Los Angeles, Calif.
G. Leslie Killian, President, Acme Wire Products Co., Gardena, Calif.

Safety Discussion—To be led by W. C. Clements, Bethlehem Steel Co., Bethlehem, Pa., with special reference to the ASI Manual—a topic of interest to many. A film, "Knowing is Not Enough," will conclude the session.

CLYDE WILSON, Wire Sales, Bethlehem Pacific Coast Steel Corp., Los Angeles, will serve as Chairman of the meeting.

o

FRIDAY, JUNE 6th

9:00 A.M. to 10:00 A.M.—Registration

10:00 A.M.—Buses leave hotel for Fontana, Calif. to visit the plant of Kaiser Steel Corporation. Arrangements will be made for luncheon at Fontana. No private cars admitted. Busses will be back at the hotel about 5:00 P.M.

6:30 P.M. to 7:30 P.M.—Cocktail Party, Los Angeles Room.

7:30 P.M.—Dinner, Golden State Room. Door prizes will be distributed. After dinner, Frank O. McIntyre will talk on "Building a Better Mousetrap is Not Enough." Mr. McIntyre is Director of Public Relations of the California Teachers Association, Southern Div., and is considered one of the outstanding speakers of the area. He has gained note for his messages on human relations in business and other subjects.

Total Cost: Registration, Plant Tour and Dinner — all for $10.00

o

Send your reservations to: JOSEPH F. CONLAN, Pres., City Wire & Iron Works, 3706 Avalon Blvd., Los Angeles 11, Cal.

Make your own hotel reservations, but tell the Statler Hotel you are attending The Wire Association meeting. A worthwhile and interesting time is promised all who attend—all wire men cordially invited. Eastern wire men are invited to be in California in June.

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

453 MAIN STREET • STAMFORD, CONNECTICUT

Line of Wire Products Results from Parent's Exasperation

How one product led to another and a thriving business was established on the Pacific Coast.

In a little more than a decade, a western industrial concern has been nurtured into full-blown success because mothers and fathers all over America liked a new idea that had lain undeveloped since the beginning of time. All because one father became exasperated trying to find space large enough in the family car for the bulky, unmanageable baby stroller.

* * *

This was back in 1938. **A. E. Peterson** took up some ideas, a few coils of steel wire, some tubing, bolts and nuts and fashioned the first all-metal folding baby stroller. Soon the family garage was swamped with units being made for the family's neighbors.

* * *

At the close of World War II, when materials became available, Mr. Peterson formed his own company and began production of the Folda Rola, the ancestor of the company's present Folda series of infant wheeled equipment. Today, the **A. E. Peterson Manufacturing Company,** with extensive plant facilities in Glendale, California, uses more than "just a few coils of steel wire and bolts and nuts". The company is the world's largest producer of foldable wheeled vehicles and furniture for young children.

* * *

Ideas still share equal importance with raw materials. That original model has evolved into several, each with its own modifications, to meet every need.

* * *

One of the newest to come off assembly lines is the Folda Siesta Twin fashioned from sturdy steel of many forms. Throughout the Peterson plant, sub-assembly departments ready the various component parts for the assembly lines. Steel wire, extra clean smooth bright in gauges from 0 to No. 6 from the nearby Bethlehem Pacific plant in Los Angeles, comes out of forming jigs into footrests, parcel baskets for mother, axles and bumpers. Steel tubing and strip make up frames and handles and other structural sections. In the Folda Twin, the designers recently incorporated a steel framed third seat in the event of triplets.

* * *

But, design has always been an important factor. First it was the Folda Rola, the so-called "standard". Then Mr. Peterson evolved the Folda Rola stroller-walker that converts to a baby walker by removing the foot-rest and tray. The Folda was modified with the addition of a three position reclining seat and swing up footrest and thus was born the Siestas.

* * *

"Some day," he opines, "we might possibly have models complete with radio to lull baby into a siesta and mother into a better frame of mind."

* * *

To get some idea of the production needed to keep pace, all one has to do is review the increasing birth rate. To keep pace with it, the company now is producing upwards of 1500 units per day. "We like to think of these simplified vehicles for children in the infant to three years age group," Mr. Peterson has said, "as the main factor in the 'take baby with you' idea." Evidently, this is no great problem. Even though steel is now used almost exclusively for greater durability, the Foldas are still light enough to carry with one hand and fold into a package 10-inches high.

(*Please turn to page* 582)

Fig. 1—Footrest and basket sections ready for the assembly line.

Fig. 2—Assembly line for the Folda Siesta Twin Stroller, featuring three-position seats.

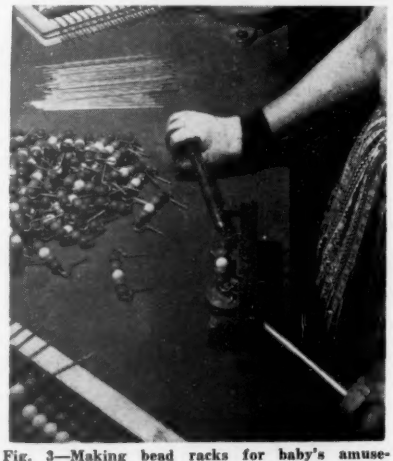


Fig. 3—Making bead racks for baby's amusement, using Bethanized wire.

Trade Practice Rates Hearing for Building Wire and Cable

The Federal Trade Commission held a hearing early in April on the Proposed Trade Practice Rules for the building wire and cable manufacturing industry.

★ ★ ★

The hearing related to industry products limited to 600 volts maximum capacity, generally referred to as types, R, RW, RH-RW, RHW, RR, TW, UF, SEU, SEA and SD.

★ ★ ★

Manufacturers were invited to present their views to the Commission orally or in writing at the Commission's offices on April 2nd, a draft of the proposed trade practice rules having been supplied to manufacturers in advance.

★ ★ ★

The scope of the rules covered such matters as substitution, misleading price lists, deceptive invoicing, discrimination (rebates, discounts, credits, etc.), price fixing, enticing employees away from competitors, defamation of competitors, tie-in sales and other points.

Booklet on Tachometers for Speed Control

The Jones Motrola Corporation, P. O. Box 825, Stamford, Conn., has published a booklet illustrating and describing its line of tachometers. Numerous applications are pictured.

★ ★ ★

The company points out that while tachometers are a factor in increasing production, many corollary advantages are often overlooked. These are greater economy, increased product quality and improved machine performance. Such speed indicators, for example, have been used to advantage in the coating of wires with insulating materials.

★ ★ ★

Included in the 12-page booklet are four pages of line drawings, of interest to engineers, showing how Jones Tachometers may be installed in different applications.

★ ★ ★

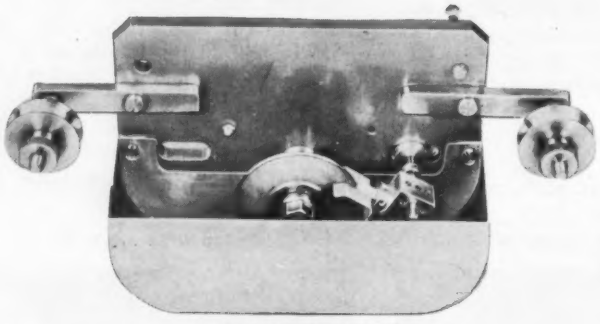
For a copy, write the company asking for Booklet 58.

New Cutter For Non-Ferrous Metals

Among the uses for this new Manco hydraulic Guillotine Cutter is to retrieve floating mandrel in cold tube reduction. Because of the clean cut achieved through the hydraulic action, chips and abrasive dust are eliminated from subsequent drawing processes. It also offers the time-saving advantage of portability as the tool can be taken to the coil.

★ ★ ★

For production or maintenance cutting the unit has a capacity of 2" O.D. x 32 wall annealed copper or brass tubing or 2" O.D. stranded copper wire. Anvil inserts are



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available for smaller diameters.

★ ★ ★

This unit, designated as the Manco MTC-210-714, is powered by a Manco 5 h.p. Hi-Thrust electric hydraulic power unit.

★ ★ ★

For complete information, write **Manco Mfg. Co.**, Bradley, Ill.

★ ★ ★

Peschel Electronics Moves to New, Larger Plant

Peschel Electronics, Inc., specialists in high voltage test equipment, formerly of New Rochelle, N. Y., has moved its office and plant to a newly acquired 204 acre site in Towners, N. Y. The post office address is RFD 1, Patterson, N. Y. The telephone numbers are Trinity 8-3251 and Trinity 8-3261. Towners is in Putnam County, 55 miles north of New York City and 1.8 miles west of Route 22, on Route 216. The plant is located on Route 216 and is within ¼-mile of the Towners railroad station.

★ ★ ★

The greatly expanded facilities will enable the company to serve better its g r o w i n g clientele through continued development and production of an expanded line of high-voltage tests sets.

New Plant for Teflon

Construction of a plant for "Teflon" 100-X, a new fluorocarbon resin which may be extruded and molded into products such as insulated wire, electronic components, tubing and linings for process equipment, is under way at Du Pont's Washington Works, Parkersburg, W. Va., it has been announced.

★ ★ ★

C. D. Bell, director of plastics sales in Du Pont's Polychemicals Department, said this manufacturing unit is expected to be in commercial production the middle of next year. Meanwhile, small quantities of the resin for research and development work are available.

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When you need steel reels, spools or bobbins fast, a wire to Apco Mossberg can save you hours of time and trouble.

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- **Sizes up to 9/16"...**
  ... down to almost the size of a human hair, in low carbon and medium low carbon steels.
- **Wire of many finishes**
  the right wire for the job—coppered, tinned, bright, galvanized and other finishes to fit your production needs.
- **Better forming and workability**
  Continental Wire is available in almost any temper and analysis in low and medium low carbon steels for your particular forming jobs.
- **Metallurgical service**
  Thousands of case histories provide unsurpassed resources for developing a practical solution to your wire problems.

ECONO-COIL—Reduces scrap loss up to 90 percent. Saves material handling time. The Econo-Coil gives you continuous length wire coils of 2000# to 3000# catchweight, in sizes from 12 gage through ½" diameter. Shipped on returnable Econo-Coil reels.

LEVERPAK—Mechanizes your wire handling, protects wire against moisture, dirt and handling damage. LEVERPAK permits long uninterrupted runs of 500# to 650#, depending on wire sizes. Saves scrap, downtime, stores easily.

SPECIAL SHAPES—D-shaped, V-shaped, oval, half-oval, half-round, square, rectangular, triangular, keystone-shaped and others. Saves fabricating and machining costs.

Chances are you have a problem right now that we can help you solve—with Wire. Call us.

CONTINENTAL

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ABSTRACTS

These abstracts are published through the courtesy and with the permission of the Industrial Diamond Information Bureau, 2 Charterhouse Street, London, E.C.1, England. Inquiries regarding them should be directed to the Bureau.

TESTS CARRIED OUT ON DIAMOND WIRE-DRAWING DIES

British Diamond Die Federation. Wire Ind 1957 Vol 24 (286) pp 945-950, 953 (Oct)

The Federation set out to ascertain whether diamond dies produced in Great Britain are inferior to those produced abroad, but no evidence of this was found. The conclusions from tests on copper drawing dies were that profile, polish and stone size are of minor importance, the quality of the diamond being the dominant factor in drawing performance. After a random examination of stainless steel drawing dies, a further examination was carried out on a series made by one manufacturer. The dies were all supplied at 0.0148 in. diameter and used for drawing 18:8 type austenitic steel wire. The orientation of diamonds was effected by an X-ray method without removing the diamond from the die. The method also serves for observations regarding the condition of the diamond and mounting faults. Dependence of die life or wear on crystallographic orientation has not been established, and would require examination of a larger number of dies. A random selection of dies revealed a concentration away from the 'four-point' direction. Most diamonds appeared oriented in a direction dependent on practical considerations. Drawing results with various diamond die makes are tabulated. 4 illustr. 4 tables.

LUBRICANTS FOR WIRE-DRAWING DIES. I & II

W. M. Halliday. Wire Ind 1957 Vol 24 (288) pp 1145-1146, 1153 (Dec); 1958 Vol 25 (289) pp 59-60, 62 (Jan)

The types of lubricant for wire drawing are described. Sodium base dry soap lubricant has good adherence and prevents metal-to-metal contact, but does not produce a high polish. Wet lubricants are used for high-speed work or where a bright lustre is required. Specialized types of lubricants and those suitable for alloys are also discussed, together with the factors governing the choice of a suitable lubricant.

THE TEXTURE OF DRAWN TUNGSTEN WIRES

G. D. Rieck. Philips Res Rep 1957 Vol 12 (5) pp 423-431 (Oct)

According to a 1924 paper by Z. Jeffries, drawn tungsten wire has a texture with the [110] axis of the grains in the wire direction, and their (001) planes parallel to the surface of the wire. The experiment described proves, by x-ray diffraction measurements, that tungsten wire has the generally accepted normal fibre texture with a random orientation of the crystals around the [110] fibre axis. 5 illustr, 4 ref, 4 tables.

BASIC INVESTIGATIONS INTO THE CRYSTALLOGRAPHY OF COLD DRAWN MUSIC WIRE

US Nat Bur Standards. Wire Ind 1957 Vol 24 (288) pp 1121, 1152 (Dec)

An investigation of preferred crystal orientation in cold drawn music spring wire revealed that the degree of preferred crystal orientation and the elastic modulus of the wire first increase, then decrease, as the diameter is reduced in the drawing process. Tensile strength of the wire increased with each reduction in size, but showed no correlation with changes in preferred orientation or modulus of elasticity. Wire drawn from steel of 0.85% carbon content was used, the diameter being 0.111 in. Eleven dies were used for reduction to 0.039 in. The maximum value of Young's modulus occurred at 0.047 in diameter. The development of preferred orientation seems to be the principal factor in the change of modulus. 2 illustr.

LUBRICATION IN WIRE DRAWING

J. G. Wistreich. Wire Ind 1957 Vol 24 (286) pp 954-955, 958 (Oct)

The fundamental research of the last few years has led to a clearer understanding of the mechanism of lubrication. According to Wistreich, means die pressure may range from 10^4 lb/in^2 for soft aluminium to 5×10^5 lb/in^2 for hard steel-rope wire. Mean interface temperatures up to 308 deg C have been recorded at 100 ft/min when drawing high carbon steel wire, temperatures in excess of 500 deg C being fairly common in industrial machines. Organic wire drawing lubricants stand up to these temperatures due to the short duration of time during which they are subjected to them. When finish is unimportant the wire is drawn dry with soap powder. Wet drawing is used for lustrous or clean surfaces. Hard metal or alloy wires are coated before drawing. Recent research has shown that lubrication in dry drawing is not essentially of the boundary type but varies, with features reminiscent of the fluid regime. Forced lubrication may be effected by using the wire itself to pump the lubricant to the required pressure. The experiments of Christopherson and others (1954, 1955) are described. Although the theory of forced lubrication is in its infancy, soap powder seems a suitable medium. The interdependence of variables which makes the mechanism of forced lubrication complicated also gives the system great flexibility, which has not yet been fully explored. (To be cont). 4 illustr.

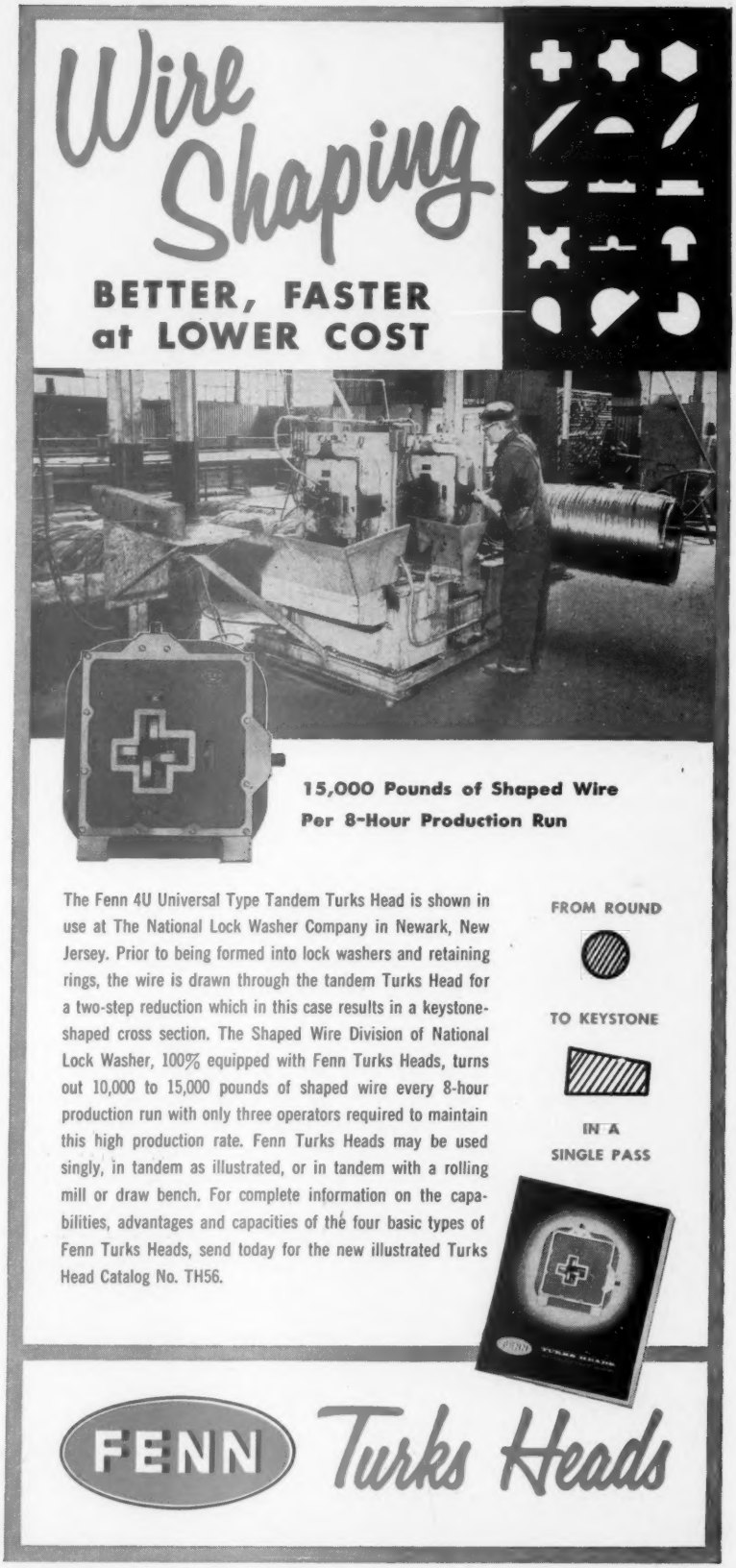
DIAMOND WIRE DRAWING DIES

British Diamond Die Federation. Met Ind 1957 Vol 91 (17) pp 353-357 (Oct 25); (18) pp 379-381 (Nov 1)

2 illustr, 6 tables. See Wire Ind 1957 Vol 24 (285) pp 831-835, 873 (Sep); (286) pp 945-950, 953 (Oct); Ind Diamond Abstr 1958 Vol 15 p A10 (Jan); this issue.

THE RELATION BETWEEN FORCES DURING WIRE DRAWING IN HARD DIES.

N. T. Deordiev. Vestn Masstro 1957 Vol 37 (10) pp 51-53; Inhaltsverzeichnisse sowjet Fachzeits 1957 Vol 6 (12) p 1276 (Dec) (Original in Russian)


Wire Shaping
BETTER, FASTER
at LOWER COST
15,000 Pounds of Shaped Wire
Per 8-Hour Production Run
The Fenn 4U Universal Type Tandem Turks Head is shown in use at The National Lock Washer Company in Newark, New Jersey. Prior to being formed into lock washers and retaining rings, the wire is drawn through the tandem Turks Head for a two-step reduction which in this case results in a keystone-shaped cross section. The Shaped Wire Division of National Lock Washer, 100% equipped with Fenn Turks Heads, turns out 10,000 to 15,000 pounds of shaped wire every 8-hour production run with only three operators required to maintain this high production rate. Fenn Turks Heads may be used singly, in tandem as illustrated, or in tandem with a rolling mill or draw bench. For complete information on the capabilities, advantages and capacities of the four basic types of Fenn Turks Heads, send today for the new illustrated Turks Head Catalog No. TH56.
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PHOSPHATE AND WATERGLASS COATING OF WIRE FOR DRAWING

I. M. Goncharov & coll. Stal' 1957 Vol 17 (5) pp 464-465 (Original in Russian)

The advantages and methods of phosphate coating steel wire are described, the principal advantages being (i) longer die life, (ii) smoother drawing, (iii) better working conditions in the wire mill, and (iv) avoidance of the coppering operation. A composition of water-glass replaces the liming and coppering stages.

[Transl av, H. Brutcher, PO Box 157, Altadena, Calif. price $5.90, No 4076].

DETERMINING THE SPEED OF DEFORMATION IN EXTRUSION AND IN DRAWING

J. Kocsis, L. Zacher. Hungar Journ Metallurgy 1957 Vol 12 (9) pp 71-75; Hungar Techn Abstr 1957 Vol 9 (4) p 127 (Original in Hungarian)

FORMATION OF COPPER DEBRIS (FLITTER) ON COPPER WIRE

E. Lindau. Erzmetall 1957 Vol 10 (10) pp 504-509 (Oct); BNF Bull 1958 Vol 38 (342) p 7 (Jan) (Original in German)

This debris consists of metallic Cu particles existing on drawn wire, but not metallically joined to it. Measurements were made of the amount present on various wires and of the origin of the material and recommendations are given for its avoidance.

VARIOUS FLAT AND SHAPED WIRES OFFERED WITH MIRROR FINISH

Techalloy Co Inc, Rahns, Pa. Machinery (NY) 1958 Vol 64 (6) p 150 (Feb)

Wires of nickel alloys and stainless steels with a mirror finish have been made available. It is claimed that this finish aids working since forming tools slide easily on the surface, and there is less chance of corrosion as there is no surface on which corrosive material can collect.

ON THE QUALIFICATION OF COPPER WIRES. I

K. R. Vassel. Hungar Journ Metallurgy 1957 Vol 12 (9) pp 79-81; Hungar Techn Abstr 1957 Vol 9 (4) p 127 (Original in Hungarian)

Blane Increases Production Facilities

An increase of approximately 30% in production facilities has been announced by the **Blane Corporation,** Canton, Mass., manufacturers of Vinyl Insulation Compounds and Vinyl Color Concentrates, a new line of which latter was recently announced that gives completely streak-free results in extrusion. A color card and price list is available upon request.

★ ★ ★

The purchase of additional production machinery was the result

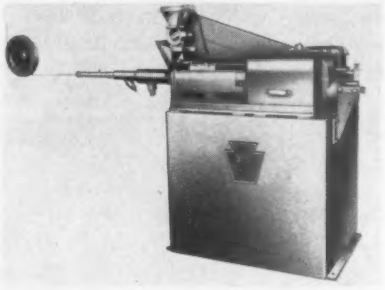
of increasing demand for Blane products by the wire and cable industry.

New Teflon* Extruder Announced

A low cost, reciprocating ram, Teflon extruder is now available from **Davis-Standard,** Mystic, Conn. Designed to produce Teflon products up to ½" Outside Diameter, the D-S Teflon Extruder delivers a smooth, properly cured finish on heavy-walled tubing and cable.

★ ★ ★

The D-S Teflon Extruder has been performance tested by constant, around-the-clock operation



Teflon Extruder. * * * * * * * *

without shutdown or loss of product tolerance. The operational simplicity and low consumption rate of this Extruder permit batteries of extruders to be fed and controlled by a single operator.

★ ★ ★

The manufacture of Teflon products at competitive prices is now possible through the low initial cost, minimum maintenance and supervision, and high product quality of the D-S Teflon Extruder. Powdered-type compounds 1, 5 and 7, which are considerably lower in cost, can also be run in this Extruder.

★ ★ ★

Basically, the extruder consists of a reciprocating ram which forces successive charges of Teflon through a heated die. When insulating wire, the conductor is fed through a tube which runs through the center of the ram. The die is heated by tubular electric heaters placed around it, with attached

*** Trade name for duPont Tetraethylfluorine resin.**

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VAST VARIETY—Knowing your problem, Riverside-Alloy can supply a stainless steel particularly suited to your needs . . . in wire, rod, or strip form. Or, lacking a stock steel, Riverside-Alloy will work with your engineers to develop new varieties.

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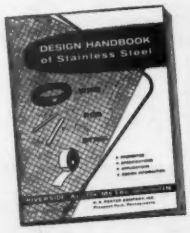
Riverside-Alloy Metal Division,
H. K. Porter Company, Inc.,
Riverside, N.J.



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RIVERSIDE-ALLOY METAL DIVISION

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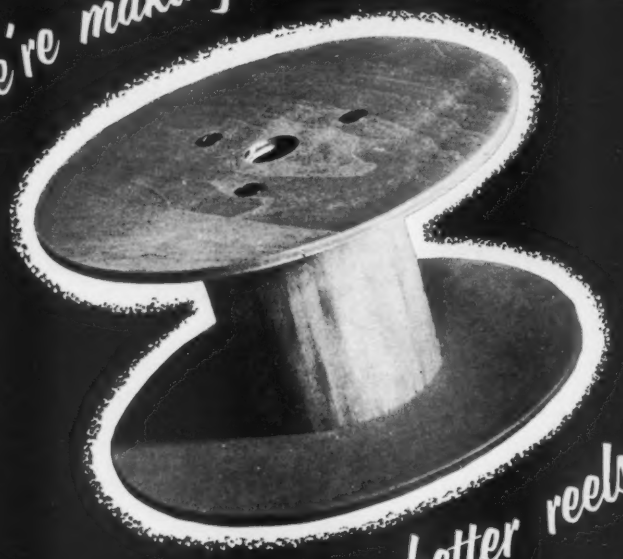

to give you even better reels!

Due to the ever-increasing demand for our spools and reels, we've had to make our second move in just two years! And in our new and spacious quarters we are manufacturing plywood. Since it's made especially for spools and reels, even better-grade products will result—CARRIS spools and reels, now QUALITY-CONTROLLED from plywood to finished spools and reels!

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INCORPORATED

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thermocouples for temperature measurement. A short section of cooling water cures the Teflon rapidly enough so that take-up units can be located adjacent to the extruder.

★ ★ ★

The new Davis-Standard Extruder opens the field of Teflon products to many plastics processors by providing a compact machine that has high quality, close tolerance delivery and the ability to operate continuously.

Booklet on Aluminum Properties and Uses

Up-to-date information on Kaiser Aluminum mill product availabilities has just been published in booklet form by Kaiser Aluminum & Chemical Sales, Inc.

★ ★ ★

In addition to giving a complete listing and description of availabilities, the 24-page brochure offers useful data on aluminum characteristics, fabricating and finishing techniques, mechanical and physical properties of alloys, and company services to customers.

★ ★ ★

Kaiser Aluminum mill products include sheet, plate, foil, circles, casting alloys, pig, alloy ingot, rod, bar, wire, electrical conductor, forgings, extrusions, extrusion billet, roofing, siding and Shade-Screen.

★ ★ ★

The 1958 edition of the mill product availabilities booklet may be obtained from **Kaiser Aluminum & Chemical Sales, Inc.,** Department NR-4, 919 North Michigan Avenue, Chicago 11, Ill.

New Blade Increases Cutter Life

Manco Manufacturing Co., Bradley, Ill., has developed a Heavy Duty Universal blade (Series HDV) for use on all standard guillotine cutting machines that combines all requirements for cutting hot, mild and extra hard steel rods in one blade.

★ ★ ★

The new blade has much longer life than previous types and makes for savings by reducing the stocks of blades that must be carried and eliminating down-time for blade changes.

★ ★ ★

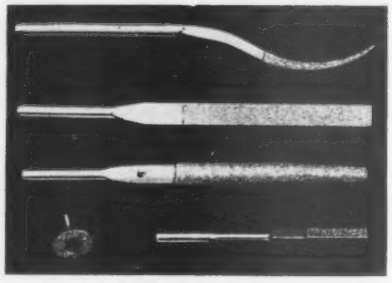
Information on the new HDV blades may be secured from the manufacturer.

Engis Diamond Files Feature New Riffler

A riffle file coated with 90 micron diamond particles and available in four shapes (cross-sections) has been announced by **Engis Equipment Company**.

★ ★ ★

The diamond particles are accurately graded and permanently



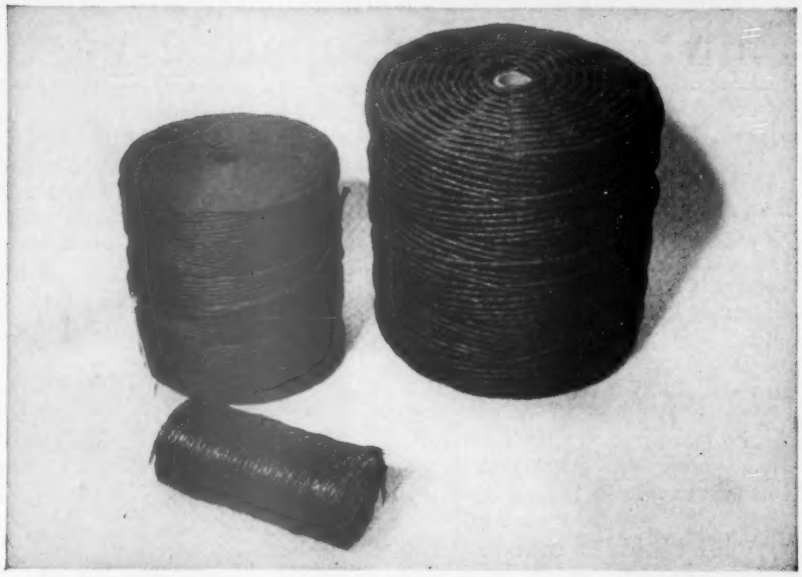
bonded in chrome deposit on a hardened steel core. The points and edges are permanently exposed for most efficient cutting action on carbides, ceramics, hardened and alloyed steels.

★ ★ ★

The rifflers, together with a broad selection of straight diamond files in numerous shapes and sizes, provide fast, economical cutting action with much longer service than is possible with conventional files; also, they can be operated at far higher speeds and temperatures. Diamond files are particularly effective for die and mold making and for many other shop requirements.

★ ★ ★

For complete description and price lists, write to Hyprez Division, Engis Equipment Company, 431 S. Dearborn St., Chicago 5, Ill.



For Fungus Resistance, Specify

TEXTILENE TWI-TAR

Offering great durability along with light weight, Textilene Twi-Tar is successfully used for buried communication cable (bedding and overall serving), expanded ACSR cable (expander between core and conductors), stationary power cable and portable cables.

Twitchell's superior Textilene line also includes: Moisture-resistant fillers — *Twi-Flex* and *Twi-Wax*. Used for non-metallic sheathed cable, maritime shipboard cable, varnished cambric cable.

Soft, dry fillers — *Twi-Port* and *Glascor** (Fiberglas-centered for high tensile strength without added bulk). Used for control, power, appliance, coaxial and communications cables, and all types of portable and flexible cords.

*Patent Applied For

For Every Wire and Cable Application
Twitchell's TEXTILENE Fillers Fill The Bill

Quality-controlled materials that are dependably uniform . . . in standard forms, or customized to special needs.

Assured supply from a reliable domestic source . . . always available in economical and convenient packaging.

Initial low cost with savings added by production efficiency . . . flexible, ready-to-use fillers that fit all equipment, handle and form easily, always maintain desired shape.

Proved performance as components of cables and wires that meet government specifications . . . stability shown by trouble-free installations in continuous service 20 years and longer.

FREE — SAMPLE SPOOLS of any type of Textilene filler to demonstrate the superiority of Twitchell materials in your operation — also technical counsel without cost or obligation. Just tell Twitchell your end-use requirements. *Write, wire, or phone today:*

E.W. TWITCHELL INC.

Third and Somerset Streets, Philadelphia 33, Pa. • REgent 9-7800

PAPER PRODUCTS FOR THE WIRE INDUSTRY

Twisted • Folded • Pressed • Crushed • Shaped • Braided • Woven

Outstanding Personalities of the Wire Industry

Chase Brass Men Promoted

Albert T. Both, since 1952 works manager of the Cleveland Mill Division of **Chase Brass & Copper Co.,** a subsidiary of **Kennecott Copper Corp.,** was appointed assistant vice president-operations, effective April 1. He is succeeded as Cleveland works manager by **Howard C. Walters,** who joined Chase in Dec., 1956, as assistant works manager. **Walter L. Smith,** vice president - operations for Chase, announced the changes.

To Head Torrington's Machine Division

H. W. Whitman was elected Vice-President and General Manager of the Machine Division by the Board of Directors of **The Torrington Manufacturing Company** following the company's annual meeting in Torrington, Conn., on March 14. The Machine Division, a major producer of wire-forming machines and flat-wire mills, recently introduced the Verti-Slide all-purpose vertical four-slide machine, after more than four years of development.

* * *

In his ten years with the Machine Division, Mr. Whitman has been Superintendent of Manufacturing, Assistant General Manager, and since early last year General Manager. He attended Princeton University where he graduated with a Mechanical Engineering degree.

H. W. Whitman

Rosseau Heads Ajax Electric

Ajax Electric Company, Philadelphia, manufacturers of salt bath furnaces, has announced the election of **Leon B. Rosseau** as President and Treasurer. He had been Vice President and General Manager.

* * *

At the same time, the company announced the election of H. W. Schrader, formerly Production Manager, to the Vice Presidency and of B. R. Russell, previously Comptroller, to the office of Secretary. Mr. Rosseau succeeds H. W. Haig, who has become a Consultant.

Glader-Years of Proven Performance
GLADER NAIL MACHINES
55 YEARS of experience meeting the exacting demands of nail making.
The machine with a record of steady dependable service.
Wm. GLADER MACHINE WORKS
210 N. RACINE AVENUE
CHICAGO 7, ILLINOIS
EXPORT DEPT. 122 EAST 42ND STREET • NEW YORK 17, N. Y.

Carpenter Steel Appoints Metallurgist

Wesley R. Kegerise has been appointed metallurgist—high temperature alloys by **The Carpenter Steel Company,** Reading, Pa.

★ ★ ★

A member of the American Society for Metals, he joined Carpenter's Metallurgical Laboratory in 1949 and was assigned to work on valve steels and high temperature alloys. In 1952, he was named to head the High Temperature & Special Alloy Development in Carpenter's Research Laboratory.

New Head for Ansonia Wire

Emmet G. Gardner, chairman of the board of **The Ansonia Wire & Cable Company,** Ashton, R. I., has announced the election of **John S. Chafee** as president, to fill the vacancy caused by the resignation of **Alden P. Lunt.**

★ ★ ★

Mr. Chafee attended Brown University and has had long executive experience in industry, including service with Brown & Sharpe Mfg. Co., Saco-Lowell Shops, Metals & Controls Corp., B-I-F Industries, Inc. During World War II, he was Director of the Tools Division of the War Production Board.

★ ★ ★

The Ansonia Wire & Cable Company produces plastic insulated

John S. Chafee

wire and cable. During the summer of 1956, it transferred its operations from Ansonia, Conn., to a new and modern plant in Ashton.

Fenn Appoints Sales Engineer

The Fenn Manufacturing Company, Newington, Conn., prominent manufacturer of roll mills and other metal forming equipment, has appointed **C. R. Toolin** as District Sales Engineer for the Cleveland-Pittsburgh area. He has been associated with Fenn for the past ten years and has served as New England sales engineer and plant superintendent. His vast experience is now available to users of metal forming machinery in these areas.

Rope Firm Elects Directors

The election of **Robert L. Stanton** and **Harold V. Pate** as directors of **American Manufacturing Co., Inc.,** one of the largest rope manufacturers in the nation, was announced in April following the annual meeting of stockholders. Mr. Stanton is General Manager of the main plant located in Brooklyn,

NOW!... A PERMANENT, PRINTED RECORD OF ALL YOUR SPARK TESTING OPERATIONS!

The New, Revolutionary JLE ***Printing-Type***

FAULT AND REEL RECORDER, Class B

Complete and accurate recording and control of your wire spark testing operations is now a reality!

JLE Printing-Type Fault and Reel Recorders totally eliminate the chance of human error or forgetfulness by automatically printing on paper tape or cards the "case history" of every reel of wire, even to indicating the distance to each fault, if desired. They are completely adaptable to the most intricate recording requirements.

JLE Recorders are available as integral parts of JLE Spark Testers, or as separate units to be connected to existing spark testers. Optional features include fault differentiation indication and reset indexing. Optional equipment includes audible bare wire signal, distance-signaling contact unit, motor-operated tape take-up reel, and a totalizing counter. Carbonized double tape is also available for duplicate recording.

James L. Entwistle Co.

SPARKING THE WIRE INDUSTRY SINCE 1918 JLE

P. O. BOX 3674 • CRANSTON 10, R. I., U.S.A.

OUR NEW, MODERN, AIR-CONDITIONED FACTORY WILL BE READY IN JULY

PHONE PA 2-7171 • CABLE "JALENCO", PROVIDENCE

NOT CONNECTED WITH ANY FIRM OF SIMILAR NAME

WRITE, PHONE OR CABLE FOR CATALOG SECTION 16A.

ENGLAND
General Engineering Co. (Radcliffe) Ltd.
Station Works—Bury Road
Radcliffe, Lancashire, England

N. Y., and Mr. Pate is Manager of their subsidiary, St. Louis Cordage Mills in Missouri. The company is a supplier of rope cores for wire rope, and Mr. Stanton, formerly of Jones & Laughlin's Wire Rope Division at Muncy, is a member of The Wire Association.

General Cable Head Treasurer of NEMA

J. R. MacDonald, Chairman of the Board and President, General **Cable Corporation,** has been elected treasurer of the **National Electrical Manufacturers Association** for the ensuing year, it is announced in April.

★ ★ ★

Mr. MacDonald, a member of the Association's Board of Governors for the last six years, succeeds **B. C. Neece,** President of Landers, Frary and Clark. Mr. Neece has resigned from the NEMA Board because of the pressure of business within his own company.

★ ★ ★

J. R. MacDonald

NEMA's new treasurer is a member of two of the Association's most important committees: Officers, Program and Budget. He also is a member of NEMA's Wire and Cable Section, Armored Cable Section and Rigid Steel Conduit and Electrical Metallic Tubing Section.

Names Plant Engineer at Coraopolis Works

Clifford A. Mikus has been appointed plant engineer at the Coraopolis plant of **Russell, Burdsall & Ward Bolt and Nut Company,** it was announced here by **Robert J. McCombs,** plant manager.

★ ★ ★

A 1945 mechanical engineering graduate of Carnegie Institute of Technology, Mr. Mikus previously served as chief engineer of Hanley Co., Bradford, Pa.; plant engineer of Pittsburgh Plate Glass Co., Greensburg, Pa.; and chief designer of Oliver Iron & Steel Corp., Pittsburgh.

Named Manager, General Products Division Sales

R. J. Dineen, representative for Allis-Chalmers Industries Group Central Region, has been appointed manager, **General Products Division sales,** Central Region, with headquarters in Cleveland.

★ ★ ★

In his new position, Mr. Dineen will be responsible for the promotion, planning and coordination of sales and the achievement of sales

FULLY AUTOMATIC

HIGH SPEED POINT CUTTING MACHINE

(Patent Pending)

Particularly designed for pointing drive screws and shot nails.
The **capacity** of this **new machine** increases **up to 6 times** the output of turning automats **(up to 250 pieces per minute),** at lowest cost.

objectives through the district offices for pumps, "Texrope" V-belt drive equipment, electrical control, and motors. He joined Allis-Chalmers in 1952. He is an electrical engineering graduate of the University of Cincinnati.

Electric Furnace Elevates Two Men

C. L. West, veteran employee and officer, has been named chairman of the Board of Directors at **The Electric Furnace Co.,** Salem, Ohio, it has been announced. He has been vice president and will remain active in the management of the company.

★ ★ ★

F. Troy Cope, Jr., also a longtime employee, will become vice president in charge of sales. His father, the late **F. Troy Cope, Sr.** was chairman of the board at his death in 1952 and the post has remained vacant since that time.

★ ★ ★

C. L. West F. T. Cope, Jr.

Other executive personnel remains unchanged. **K. U. Wirtz** is president; **Richard E. Coe,** vice president, assistant secretary and controller; **W. L. Ferguson,** secretary-treasurer and **C. H. Vaughan,** assistant vice president.

Rome Cable Research Director Discusses Synthetic Rubber

Rudolph A. Schatzel, vice president and research director of Rome Cable Corporation, Rome, N. Y., outlined the growing importance of synthetic rubber to the electrical wire and cable industry at a panel discussion of the Commercial Chemical Development Association's annual meeting in New York City on March 27th.

★ ★ ★

Mr. Schatzel has been in the wire and cable field since 1924 and joined Rome Cable in 1945. He is a graduate of Union College, Schenectady.

★ ★ ★

He was president of the American Society of Testing Materials in 1956; served as chairman of the Technical Advisers Committee on Wire Insulation for the War Production Board; was a member of the Rubber Division of the Department of Commerce; a representative on the National Research Council Committee for War Dielectrics, the committee which developed Teflon.

Kaiser Sales Appointments

Six management appointments

NOW READY FOR INSTALLATION!

The New Cook

Hot-Dip Tank Tinner

Here's a complete tinning system, including: Supply Stand, Flux Pot, Tinning Tank, Water Cooling Tank with Recirculating Pump and Spool Take-Up Unit. An extremely fast unit producing uniformly tinned wire.

- **Can be built to accommodate customer's specifications as to supply and take-up spools.**

- **LOW INITIAL INVESTMENT**
- **COMPACTLY DESIGNED**
- **SPEED: 1000 ft. per minute**
- **CAPACITY: Will accommodate 12 to 20 Lines or Spools**

A complete Line of Quality Machinery For The Wire and Cable Industry To Meet Rigid Specifications.

COOK
MANUFACTURING CO.
50 EAST 25TH STREET
PATERSON, N. J.
ARMORY 4-6380

in the sales department of **Kaiser Aluminum & Chemical Corporation's** recently established Electrical Conductor Division have just been announced by **Gillette N. Houck,** division sales manager.

★ ★ ★

They are **J. C. Ferguson,** product manager; **R. J. Harrison,** assistant product manager; **H. F. Johnson,** administrative manager; and three program coordinators including **J. A. Leuver,** industrial, light and power; **H. H. Weber,** utilities; and **P. W. Ward,** distributors and warehouses.

★ ★ ★

The appointments are in conjunction with the organization of the Electrical Conductor Division's new general sales office in Chicago.

New Kaiser Aluminum Appointments

The appointments of **Clarence W. Higbee** as assistant general manager and **Gillette N. Houck** as sales manager of the newly established Electrical Conductor Division, **Kaiser Aluminum & Chemical Corporation,** were announced in October by **J. T. Dugall,** general manager of the division.

★ ★ ★

Six regional sales managers for the division have also been appointed to supervise the sale of electrical conductor products, as follows: **J. W. Loveland,** Northeastern, New York; **W. J. Lawrence,** Southeastern, Philadelphia; **H. B. Stauffer,** Great Lakes, Cleveland; **J. G. Johnson,** North Central, Chicago; **E. K. Matteson,** South Central, Kansas City; and **L. M. Guibara,** Western Los Angeles.

C. W. Higbee, Asst. G. M. Elec. Cond. Div. * *

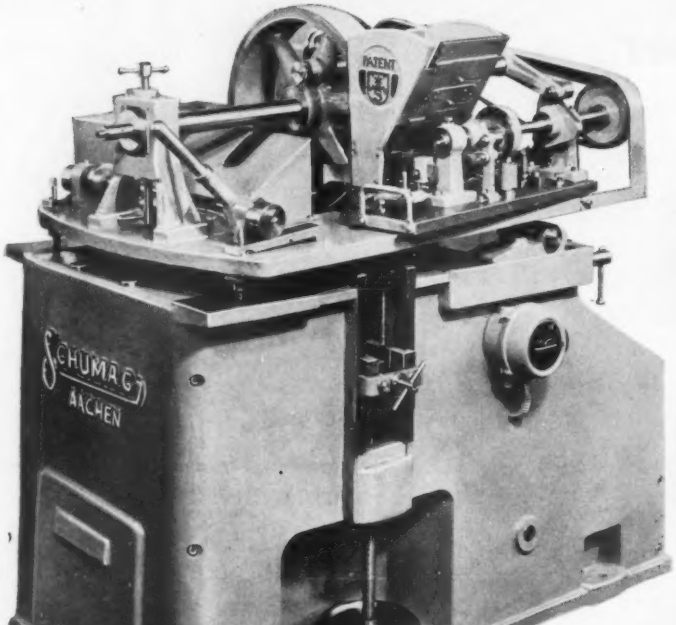
Heads Engineering Section for General Electric

William A. Reich has been appointed manager of the Engineering Section of **General Electric Company's** Metallurgical Products Department in Detroit, it was announced by **Kenneth R. Beardslee,** general manager.

★ ★ ★

Formerly manager of advance engineering, he has specialized in the fields of powder metallurgy, high temperature alloys and nonferrous casting. He joined General Electric in the research laboratory in 1938, after receiving a B.S. degree at Carnegie Institute of Technology.

★ ★ ★



SCHUMAG AACHEN

Automatic Pointing Machines

For Mass Production

Rates 6,000 - 70,000 pieces/hr.

These machines are designed for completely automatic, high volume pointing of needles and other small cylindrical parts. Length of points adjustable.

Five models:

Shaft lengths from 1½" to 18"
Diameters from .020" to .390"

Exclusive Representatives
for U.S.A., Canada and Mexico

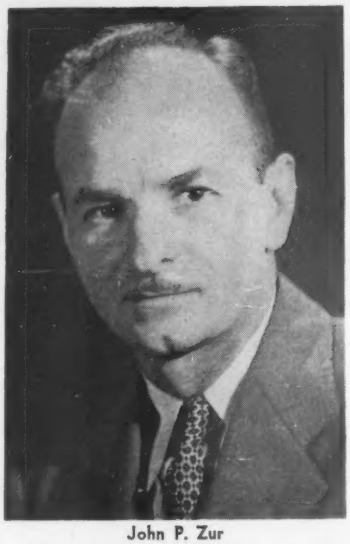
AMERICAN LAUBSCHER CORPORATION

Fisk Bldg., 250 West 57th St., New York 19, N. Y.

In his new position, he will be responsible for all Carboloy cemented carbide engineering operations, including engineering consultation, administration, advance engineering, applied mechanics, products design and products development.

Heads Sunbeam's Furnace Engineering Staff

John P. Zur has been promoted from Chief Engineer of Non-Ferrous Metals and Wire to Chief Engineer of the Industrial Furnace Division, **Sunbeam Corporation,** Chicago.



John P. Zur

★ ★ ★

Prior to joining Sunbeam in 1956, Mr. Zur was Vice President of **Trauwood Engineering Company** and Production Manager for **Lee Wilson Contracting Company.**

★ ★ ★

Mr. Zur is a member of **The Wire Association** and a Registered Professional Engineer at Ohio State.

Crucible Steel Executive Retires

The retirement of **R. S. Poister,** Senior Vice President of **Crucible Steel Company of America** was announced in March by **Joel Hunter,** Company president. Mr. Poister's retirement became effective April 1.

Mr. Poister, a 44-year veteran of the steel industry, joined Crucible in 1947 as Vice President—Operations, Pittsburgh District. He was named Vice President—Operations for the entire company in 1949, and has been Senior Vice President since 1954.

Anjeskey Retires From Cleveland Tramrail

A dinner was given at the Hillbrook Club by **The Cleveland Crane & Engineering Co.,** attended by 75 members of the company to honor **A. F. Anjeskey,** Sales Manager of the Cleveland Tramrail Division, who retired after 38 years with the company.

★ ★ ★

Herbert T. Florence, Executive Vice President and General Manager, presented Mr. Anjeskey a beautiful silver tray engraved with the signatures of 124 associates at the home office and plant and at 55 Cleveland Tramrail distributors' offices.

★ ★ ★

Mr. Anjeskey is well known throughout the materials handling industry and has been very active in the affairs of the Materials

the right combination

YOUR SPECIFICATIONS and BURLINGTON PRODUCTS

TAKE-UPS—"A" FRAME, ROLLER, TRAVERSING — **PAY-OFFS — CAPSTANS — REEL ARBORS — LARGE SHOP REELS — RE-REELERS — COILERS — REEL RACKS — STRAND GUIDES — DRIVE-IN PALLET RACKS**—FOR COMPOUNDS AND REELED WIRE.

BFI STD. PRODUCTS DIV.
BURLINGTON FABRICATORS INC.
BURLINGTON, N. J.

Handling Institute and the Monorail Manufacturers Association. He will continue to serve as president of the latter organization.

★ ★ ★

He has been closely identified for many years with The Wire Association and has contributed much to the advancement of the Wire and Rod Industry. He pioneered the development of special gantry cranes which revolutionized the method of cleaning wire and rod preparatory to drawing, resulting in a tremendous improvement in production efficiency and working conditions.

★ ★ ★

Also, in the Wire Industry, he introduced and promoted a special grab for use with overhead materials handling tramrail systems that picks up 3600 lbs. or more of coiled wire and handles it vertically or horizontally like a giant hand. This grab made possible the orderly storing of wire and rod in vertical piles to heights of 20 feet and higher, thereby saving a vast amount of storage space and providing other important advantages.

★ ★ ★

Mr. Anjeskey holds twenty patents on materials handling ideas. He has written many articles on

A. F. Anjeskey (left) receiving silver tray from Herbert T. Florence, Exec. V.P. and Gen. Mgr. of The Cleveland Crane & Engineering Co.

the subject for various industrial publications and has given many talks to groups all over the country.

★ ★ ★

He is succeeded by **John G. Frischkorn, Jr.** as Sales Manager of the Cleveland Tramrail Division. Mr. Frischkorn was design engineer for 16 years on materials handling equipment, and for the past year has been assistant sales manager. He also was with the Euclid Crane and Hoist Co. for five years as Chief Engineer and Sales Manager.

William J. Cook

William J. Cook, sixty-eight, who retired in March as president of **Hunter Spring Company,** Lansdale, Pa., died on April 6, 1958. Active in the coil spring manufacturing industry for virtually his entire working life, Mr. Cook had been with Hunter Spring for over thirty-five years in its growth from a local metal stamping firm, to its present position as a leader in the development and manufacture of precision springs and new types of mechanical spring elements. After joining Hunter Spring as plant superintendent in

. . . for the BEST in RESPOOLERS

THINK OF WIM

Wim Model "B" Remote Control Unit

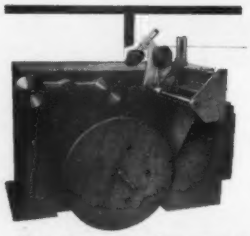
THE WIM MODEL "B" RESPOOLER

THE MOST VERSATILE REWINDER AVAILABLE TODAY

Here is a machine that spools or coils at speeds up to 1500 F.P.M. It will accomodate spools up to 18" in diameter on the upper shafts and up to 30" in diameter on the lower. A power operated indexing head, designed to handle heavy spools up to 18", insures maximum safety—"eliminates operator fatigue" and reduces down time. This unit equipped with a 3 H.P. variable speed drive and a four speed transmission guarantees constant product speed with maximum pulling power for various barrel diameters. Phone, write or wire for complete details.

FEATURES

1. High and low winding positions.
2. Power operated indexing heads.
3. All electric traverse.
4. Adjustable line speed 10:1 range.
5. Four speed transmission.
6. Complete intergrated control including disconnect switch.



View above shows 30" spool in position on lower shaft.

W I M

WIRE INSULATING MACHINERY, INC.

Division of Machinery Electrification, Inc.

35 HUDSON ST. NORTHBORO, MASS.

1924, he became vice-president and general manager, and in 1954 president.

National Electric Canadian Plant Nearing Completion

W. C. Robinson, Jr., president of **National Electric Products Corporation,** Pittsburgh, Pa., has announced the formation of a Canadian subsidiary—**Nepco of Canada Ltd.**—with plant and offices in Woodstock, Ontario, Canada.

★ ★ ★

The Canadian plant will be the first manufacturing facility that National Electric has built outside the United States. Other plants are located in Linden, New Jersey and Ambridge, Pa.

★ ★ ★

Construction of the new plant has progressed rapidly and completion is scheduled for late April, 1958.

"Steel Horizons"

The development of a metal structure capable of withstanding the melting temperatures and crushing forces of supersonic flight is explained in the latest issue of "Steel Horizons," the quarterly published by **Allegheny Ludlum Steel Corporation,** Pittsburgh, Pa.

★ ★ ★

The techniques used to combat the high heats and pressures of faster-than-sound travel is the basis for the lead story. Additional stories cover stainless, electrical and tool steels, including an expansion program for a power and light company that switched to stainless steel tubing for longer life. More than a dozen other items are included.

Installs Special Soldering Unit

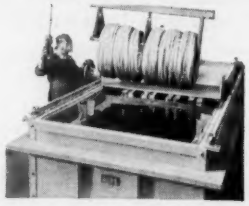
Little Falls Alloys, 191 Caldwell Avenue, Paterson, N. J., has announced the installation of facilities for hot solder dipping of wire. The company manufactures round, flat, square and half round wire of various special alloys and compositions, for springs, forms and other miniature formed parts for use in the electronic and instrument industries. Their present line consists of beryllium copper, tempered alloys, nickel clad iron, brass, bronze, phosphor bronze, silver plated and other special non-ferrous alloy wires.

★ ★ ★

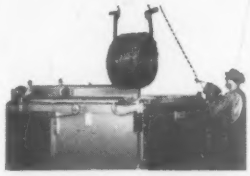
Hot tin or solder dipping consists of drawing the wire through various baths that clean and prepare the surface of the wire to be dipped and then through a molten bath of pure tin or 60-40 composition solder. This new process prepares the wire for use in printed circuit type assemblies and other places where multiple dipped soldering technique is employed.

Garment Hanger Division Sold

Young Spring & Wire Corporation sold the manufacturing facilities of its Star Service Hanger Division to **M & B Metal Products Company** of Birmingham, Ala., a garment hanger manufacturer, according to **Thomas Couper,** Young's general vice president. Young had manufactured garment hangers at Leeds, Ala., and Chicago, Ill.



TYPICAL — The Ajax installation at right treats 1000 lbs. of aluminum alloy wire an hour. It is also used for annealing brass and copper wire and for stress relieving cold headed C1008 ½" steel rods. (Lower left) 700 lb. charges of steel wire are brought to annealing temperature in less than 15 minutes, clean, scale-free and without decarburization.



faster
more uniform
heat processing
AT LOWEST EQUIPMENT COST

AJAX
HULTGREN
electric
SALT
BATH
furnaces

Heating cycles are a matter of minutes . . . NOT hours. Bigger charges are handled far faster . . . in less floor space . . . in electric salt baths that cost about half the price of atmosphere furnace equipment of equal capacity. Molten salt seals out all air, preserves wire surfaces, guards against scale and decarb. Wire quality and uniformity are improved . . . because no other method matches Ajax Salt Baths for heating uniformity. Ideal for low- and high-carbon steels, stainless, aluminum, copper alloys and silver alloys.

WRITE FOR case history bulletins on ☐ Process Annealing; ☐ Descaling; ☐ Patenting; or ☐ Cleaning, Preheating or Fluxing. These describe actual Ajax salt bath installations and actual wire processing results obtained.

AJAX ELECTRIC COMPANY
928 FRANKFORD AVENUE., PHILADELPHIA 23, PA.

Associates: Ajax Engineering Corporation • Ajax Electrothermic Corporation

A Review of Recent Wire Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.

Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.

No. 2,825,091, WIRE COATING APPARATUS, patented March 4, 1958 by John W. Burley, Havertown, Pa., assignor to Jennings Machine Corporation, a corporation of Pennsylvania.

The apparatus includes two ovens interposed in the path of a wire from a die, guided by a wire guide for conducting the wire upwardly through the first oven and thence horizontally, and downwardly through the second oven.

★ ★ ★

No. 2,825,481, WIRE BASKET CONSTRUCTION, patented March 4, 1958 by Clarence S. Glenny, Rockford, Ill., assignor to The Washburn Company, Worcester, Mass., a corporation of Massachusetts.

This basket is constructed of a network of wires welded together with a special top frame construction. There are 10 claims.

★ ★ ★

No. 2,825,950, CLOTHES PIN CLIP, patented March 11, 1958 by Willard W. White, Milwaukee, Wis.

A single wire clothes pin clip is disclosed, including a wire coil with hooked loop ends.

★ ★ ★

No. 2,826,035, STRANDING MECHANISMS, patented March 11, 1958 by Kenneth O. Cogger, Wenatchee, Wash., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

More specifically, this patent relates to a tandem cable stranding mechanism of the strand pay-off and strand build-up reels type.

★ ★ ★

No. 2,826,251, WIRE FEEDING AND CUT OFF APPARATUS, patented March 11, 1958 by Durward Kenneth Hopkins, Peoria, Ill., assignor to Sommer Products Co., Peoria, Ill., a corporation of Illinois.

The apparatus includes a movable guide for moving the wire with it as the guide moves, with a cut-off member fixedly mounted adjacent the guide and cooperating therewith to cut the wire upon movement of the guide and wire relative to the cut-off member.

★ ★ ★

No. 2,826,383, WIRE MESH CONVEYOR BELT, patented March 11, 1958 by Earle F. Spencer, Jr., Winchester, Mass., assignor to Wire Belt Company of America, Winchester, Mass., a corporation of Delaware.

This belt includes individual strands formed with alternate straight portions extending across the line of travel of the belt and bent portions extending between the straight portions so that adjacent strands are interlocked, an articulate splicing strand having the same overall configuration as the interlocked strands, the splicing strand being formed with a number of wire segments disposed end to end and individually interlocked with the respective end strands of the belt.

★ ★ ★

No. 2,826,394, FENCE CONSTRUCTION patented March 11, 1958 by Abraham Pinson, Brooklyn, New York.

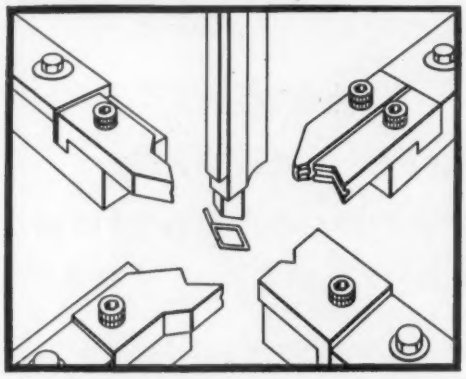
A wire mesh fence structure is disclosed of wire mesh, with special means to secure it to U-shaped rails.

★ ★ ★

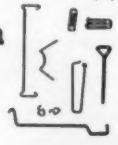
No. 2,826,768, STABILIZER FOR INNER SPRING UNITS, patented March 18, 1958 by Gustav Drews, Garden City, N. Y., assignor to Eclipse Sleep Products, Inc., New York, N. Y., a corporation of New York.

The stabilizer includes a continuous wire extending at least the length of one side of the wire sprig unit formed into intervening abutment lengths and a number of alternate S-shaped and alternate inverted S-shaped configurations, all in a common plate, each configuration having two equal open loops, and one abutment length between each

NILSON 4-SLIDES FORMING PRODUCTION PROFITS... Automatically



PRODUCT: Deadlock Hook
MATERIAL: Soft Basic Wire
PRODUCTION: 280 Pieces Per Minute
MACHINE: No. S-0 Nilson 4-Slide



16,000 PARTS PER HOUR on a NILSON Automatic 4-SLIDE

Whether your product is formed simply... or requires complex bending in several planes . . . a Nilson 4-Slide may be the solution to your production problems.

The sketch above shows the tooling used by a leading manufacturer to mass-produce metal hooks—at the rate of 280 pieces per minute! A Nilson 4-Slide has proved to be the most efficient, economical way to manufacture this product . . . and many other kinds of wire forms and small metal stampings.

Manufacturing costs must be kept down to meet today's competition. The combination of high speed and product uniformity—basic advantages of Nilson 4-Slides—means maximum production, minimum operating costs.

Before you design, tool, or specify manufacturing methods for your product, get in touch with Nilson. Over 60 years of experience with wire and metal forming applications can help you form better products . . . more profitably.

NILSON
THE A. H. NILSON MACHINE CO.
1506 Bridgeport Avenue • Shelton, Conn.
AUTOMATIC WIRE & RIBBON METAL FORMING 4-SLIDE MACHINES • WIRE & STOCK REELS • WIRE STRAIGHTENING EQUIPMENT • AUTOMATIC STAPLE FORMING MACHINES • SPECIAL WIRE FORMING EQUIPMENT

S-shaped and inverted S-shaped configuration, of which abutment lengths, alternate lengths are disposed adjacent to the upper border forming wire and the other alternate lengths are disposed adjacent to the lower border forming wire, with the configurations functioning to yield under pressure in a lateral direction within the common plane of the border defined by the border forming wires.

★ ★ ★

No. 2,826,782, FORMING DEVICE FOR INSULATED WIRE, patented March 18, 1958 by John T. Dugall, Charles M. Fredrickson, and Emerson D. Holman, Newark, and Ralph L. Wohlforth, Granville, Ohio, assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif., a corporation of Delaware.

A die is disclosed for use with an extrusion apparatus and adapted to form plural commonly insulated conductors wherein the cross-sectional area of the common insulation between the conductors is interrupted to facilitate parting of the insulation between the conductors.

★ ★ ★

No. 2,827,198, FABRICATED BOTTLE CARRIER, patented March 18, 1958 by Raymond W. Parks, Hagerstown, Md., and Robert H. Bergman, York, Pa., assignors to Davey Products Co., Inc., Red Lion, Pa., a corporation of Pennsylvania.

This bottle carrier is constructed of wire formed into a circular wire base and upper wire bottle holder, with cross wires, and a central wire handle.

★ ★ ★

No. 2,827,510, ELECTRIC CABLES FOR TRANSFORMER LEADS AND THE LIKE, patented March 18, 1958 by George O. Hunsinger, Ambridge, Pa., assignor to National Electric Products Corporation, Pittsburgh, Pa., a corporation of Delaware.

The wire cables are wound with crumpled paper strips. There are 11 claims.

★ ★ ★

No. 2,827,962, APPARATUS FOR TREATING STRIP AND THE LIKE, patented March 25, 1958 by Albert J. Sarka, Maple Heights, Ohio, assignor to Wean Equipment Corporation, Cleveland, Ohio, a corporation of Ohio.

Apparatus for treating rapidly moving strip and the like moving in a path is disclosed, with a first member for acting on the strip mounted to operate in a circular path a portion of which lies in the first mentioned path, and a guide extending generally transversely of the first mentioned path mounted to move with the first member and a second member for acting on the strip mounted to reciprocate in the guide. There are 15 claims.

★ ★ ★

No. 2,828,091, GUIDE MEANS FOR REMOVING WIRE FROM STATIONARY REEL, patented March 25, 1958 by George W. Bell, Sterling, Ill., assignor to Northwestern Steel & Wire Company, Sterling, Ill., a corporation of Illinois.

The device is especially adapted to guide wire taken off large horizontal stationary coils of wire from a position above the coils.

★ ★ ★

No. 2,828,234, TWINNING, OR DUPLEXING, PLASTIC INSULATED WIRES, patented March 25, 1958 by Mathew Carl Hengel, Latrobe, and James Harvey Steele, Belle Vernon, Pa., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A method of producing electrical cable composed of two strands of insulated wire is disclosed, comprising: depositing plastic insulation on each of two separate wires from a liquid suspension of the plastic to form coated wires; contacting together the coated wires, at least one of which being coated with plastic insulation in a still uncured tacky condition and curing the uncured coating.

Adds Preheaters to Line

The Federal Manufacturing Company, North Cherry St. Ext., Wallingford, Conn., has announced the addition of wire preheaters to its line of equipment for the wire and cable producing industry.

★ ★ ★

Two pilot models have been engineered and constructed to cover the more popular wire sizes but

Standardize on ACROPAK* Spools!

Only ½ the Weight!

Light Weight
Precision built
Reduced cost
Longer life
Extra strength
Dynamic balance
Greater production
Low cost reconditioning
Less maintenance
Attractive packaging

YET STRONG, TOUGH, RIGID . . *LONGER LIFE*

ACROPAK Spools will help you cut wire packaging costs because they give longer service, require less maintenance and cost less to ship. They're strong. They'll take repeated shippings and still run true on the arbor. They're machined to close tolerances. You can run them at high production speeds with fewer snags, less toe-out and minimum end breakage.

THEY CUT YOUR SPOOLING COSTS

Best proof of ACROPAK superior performance are the millions of these spools now used by the biggest names in the wire industry. We've proved it to them—let us prove it to YOU.

★ We also make a complete line of heavy-duty shop processing STEEL SPOOLS built to the same high standards of accuracy and rigidity as the famous Acropak aluminum spools.

ACROMETAL PRODUCTS INC.
616 5th Street North, Minneapolis 1, Minn.

preheaters will be built to order for other wire sizes that may be needed by manufacturers of insulated wire.

★ ★ ★

The company also announced that it has added to its line of insulation testors new DC and electronic testors.

★ ★ ★

Information on this new equipment is available upon request to the manufacturer.

Conference on Galvanizing

The Fifth International Galvanizing Conference will be held June 22-27 under the auspices of the Brussels Universal Exhibition.

★ ★ ★

Technical papers, including a session on wire galvanizing, will be presented and visits to leading industrial plants have been arranged.

★ ★ ★

Copies of the program, which contains reservation forms, may be secured from the Zinc Development Association, 34 Berkeley Square, London W. 1.

Syncro to Produce Continuous Coiler

The Syncro Machine Company, Perth Amboy, N. J., announces the completion of a license agreement with the **Societe Geoffroy-Delore** of Paris, France, under which Syncro has obtained exclusive U. S. manufacturing rights to the Geoffroy-Delore Continuous Coiler.

★ ★ ★

This mechanism was fully described in an article prepared by **Mr. Otto Haugwitz,** Engineering Assistant to the General Manager of Geoffroy-Delore, the article appearing in the December 1957 issue of **WIRE AND WIRE PRODUCTS** This device, which is of patented construction, is arranged for installation behind copper wire drawing machines and is capable of taking up continuously, without stopping the producing machine, hard drawn copper wire or annealed copper wire, when used in conjunction with Syncro's well-known Continuous Annealers. No sacrifice in normal drawing machine speeds is occasioned when using this device due to the fact that the barrel or container receiving the wire is stationary, and truly continuous operation of the producing unit and the take-up means therefore is obtainable. Syncro's affiliated company, **Winget-Syncro Limited,** at Rochester, Kent, England, are also being licensed simultaneously, so that it can offer the same advanced equipment in its market area.

★ ★ ★

Tests are being undertaken by Syncro to adapt this unit for the continuous taking up of all types of ferrous and non-ferrous wire, in conjunction with wire drawing operations.

Modifies Rod Mill for Bars

A new double cooling bed has just been added to the Morgan Rod Mill of **The Colorado Fuel & Iron**

GREATER FLEXIBILITY IN WIRE STRAIGHTENING AND CUTTING WITH VARIABLE SPEED DRIVE

. . . in a low cost machine

- Select-O-Speed Drive permits selection of infinitely variable feed speeds from 25 to 155 FPM for all types of wire and rod.
- Available with super-sensitive electric trip mechanism.
- High-Speed Five-Die Straightener Arbor, mounted on ball bearings.
- Lewis engineered, simple, rigid, dependable . . . of best materials and workmanship.
- Ideal for manufacturers of stove and refrigerator racks, lamp shades, wire baskets, garment hangers, welding rod and other products where small diameter wire is used.

Lewis 1-C Automatic Wire Straightening and Cutting Machine. 1/16" to 1/8" capacity.

For further information write:

THE LEWIS MACHINE COMPANY

3441 EAST 76TH STREET • CLEVELAND 27, OHIO

Corp., in Pueblo, Colo., that will enable the plant to produce straight bars.

★ ★ ★

Before installation of the new double cooling bed, the ⅜-inch to ⅝-inch reinforcing bars were produced on the 10-inch Mill. Production of these small bars will be switched to the Rod Mill, and the 10-inch Mill will be completely given over to the production of the heavier sections.

★ ★ ★

The unit, designed and almost entirely manufactured at the Pueblo plant, consists of a delivery table, a 270-foot-long cooling bed, a cut-to-length table and a crane runway. In addition there are two sets of shears—one set of hot flying shears located ahead of the bed and one set of cold finishing shears located on the delivery side of the bed.

★ ★ ★

At a temperature of about 1800 degrees, the bars travel along the delivery table at an average speed of 1500 feet per minute. On reaching the cooling beds they are cut to the desired length by an electronically operated shearing mechanism which is set into operation by the radiation of the metal.

★ ★ ★

Further down, the bars pass another set of electronic devices which cause them to be ejected onto smooth surface cast iron straightening pockets where they slide until stopped by friction and loss of momentum. From there they are picked up by lifting fingers, deposited on escapement racks and lowered onto the shuffle bar section.

★ ★ ★

Dropped by the shuffle bars onto a run-out table, and cut by the cold finishing shears into lengths of 20 to 60 feet, the bars are then pneumatically kicked off into cradles. When the total weight in the cradle reaches 5000 pounds, a multi-hook crane picks up the load and deposits it into one of the 40,000-pound-capacity bolsters located under the crane runway. From there the load is hauled by a Ross carrier to storage and shipping warehouses where it is unloaded with conventional overhead cranes.

Porter Acquires Kidd Drawn Steel

Kidd Drawn Steel Co., Aliquippa, Pa., has been bought by **H. K. Porter Co., Inc.,** according to an announcement by **J. O. Flower,** Vice President and General Manager of Porter's Vulcan Crucible Steel Division.

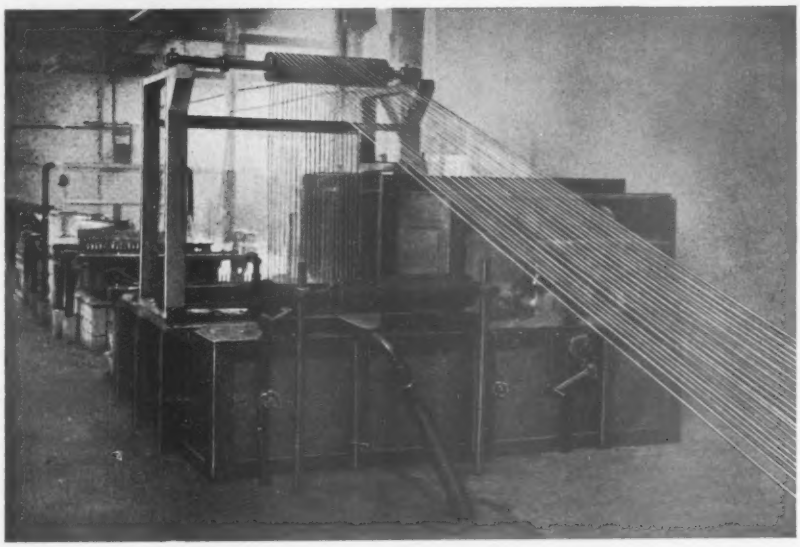
★ ★ ★

Kidd, manufacturers of drill rod and other special shapes of cold-drawn steel, will be combined with the Vulcan Crucible Steel Division whose property it adjoins. **W. Scott Bliss,** former president of Kidd Drawn Steel, will remain as manager of Kidd products.

★ ★ ★

Vulcan Crucible, one of the ten Porter divisions, is a basic producer of carbon, alloy and high speed tool steels.

CERAMIC TANKS ARE MAKING HEADWAY!



COVER HEATED galvanizing furnace for wire
(German and Foreign Patents issued)

Why?

- Unlimited pot life
- No penetration or erosion
- Less dross
- Low installation costs
- No zinc run-out channels
- Easy temperature control

★

for
WIRE, HEXAGON NETTING
STRIP, and PIECE GOODS

★

Operation by Gas or Oil

★

Please write for details.

German Patents applied for
and Foreign Patents issued

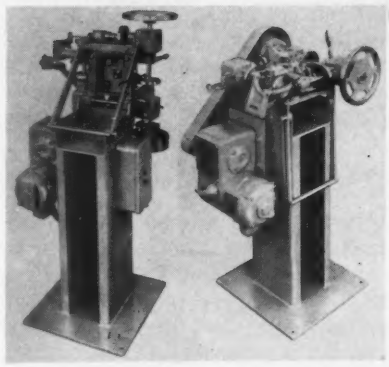
OFENBAU FRITZ G.m.b.H. HAGEN i.W., W.-GERMANY

New 4-Slide Features "Flip-Top"

Unusual design features in Baird's new Model 00 Automatic 4-Slide Wire Forming Machines include a "flip top" vertical swing bed which, as shown in the illustration, permits raising the machine to vertical positions for tooling, adjustment and maintenance. When in operation the horizontal position is used. The arrangement combines the ready accessibility of the vertical position when tooling or servicing, with the desirable features of the horizontal position when in operation. The machines also provide increased feed length up to 4¼", with ample tooling areas at each position, opening up many new opportunities for use of this type of equipment to produce small precision formed parts now being made by other more costly methods.

★ ★ ★

Descriptive bulletin with specifications available on request from **The Baird Machine Co.**, 1700 Stratford Ave., Stratford, Conn.



New Baird "Flip Top" 4-Slide Machine. * *

Phifer Wire Products Adds New Line

Phifer Wire Products has announced a new carton packaging for the company's aluminum insect screening.

★ ★ ★

Called "Quik-Tak," the rolls are ready-cut for the customer. Each carton contains 16 rolls of Alclad Aluminum Screening. Rolls are 66 inches long and available in standard widths of 24, 26, 28, 30, 32, 34, 36, 42 and 48 inches. These rolls are not made to replace the company's standard 100 foot rolls, but to supplement them.

★ ★ ★

Advantages to retailers are: no costly measuring or cutting, no floor rack needed and self service. Each roll is pre-priced—no price figuring necessary. They are made by Phifer Wire Products, Box 9007, Tuscaloosa, Ala.

Welded Fabric's Firm Expands

In April, **National Wire Products Corp.**, Fisher Rd. and P.R.R., Baltimore 22, Md., completed construction of a 50,000 sq ft building near its present plant in Baltimore. Also near completion is a 10,000 sq ft branch plant at Tampa, Fla. The firm makes welded wire mesh.

SEE THE DIFFERENCE YOURSELF...
BETWEEN JUST ANY SPOOL AND
Superior MPS
NO-CREV SPOOLS
No-Crev Spools eliminate the conventional crevice at the inner junction of spool head and barrel. No more production slow-ups due to fine wires getting caught in such a crevice. You can now have continuous trouble-free high speed winding.
We invite your inquiries — let us tell you more about No-Crev Spools. Write us today.
MPS
NO-CREV SPOOLS
give you brute strength with dimensional precision, concentricity, and balance. Another patented MPS development engineered to help you!
Mossberg PRESSED STEEL Corporation
18 WEST ST., ATTLEBORO
MASSACHUSETTS, U. S. A.
Telephone Attleboro 1-0848
#108

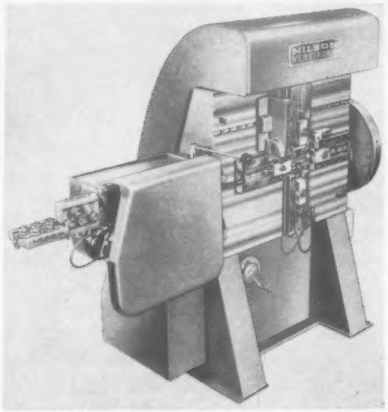
Introduces New Vertical 4-Slide Machine

The A. H. Nilson Machine Company, Shelton, Conn., announces the development of a vertical 4-slide forming machine, the V-187 "Vertiform." The new Vertiform is basically an automatic 4-slide machine with the forming done in a vertical rather than a horizontal plane. Departing from conventional means of actuating the forming slides, the Nilson design incorporates a drive shaft located behind the face of the machine. Forming slide rolls have needle bearings and are placed in the center of the slides to give a centralized thrust from low-angle barrel cams, mounted rigidly in the frame to completely eliminate shaft spring. With this design, "lift up" and "twisting" action is reduced to a minimum.

★ ★ ★

An advantage of the vertical arrangement is that the finished product is ejected to the front, not being limited in size by having to pass through an opening in the bed. Since the machine lends itself to discharging work onto rails, it is readily adaptable to automation processes. Other advantages are:

1. Greater accessibility of tooling
2. Unobstructed view of product being formed
3. Form bracket rigidly mounted in bed
4. Maximum safety—most moving parts enclosed
5. Less floor space required
6. Adaptable to hopper or magazine feeding



For further information on the new Vertiform, write The A. H. Nilson Machine Co., Shelton, Conn.

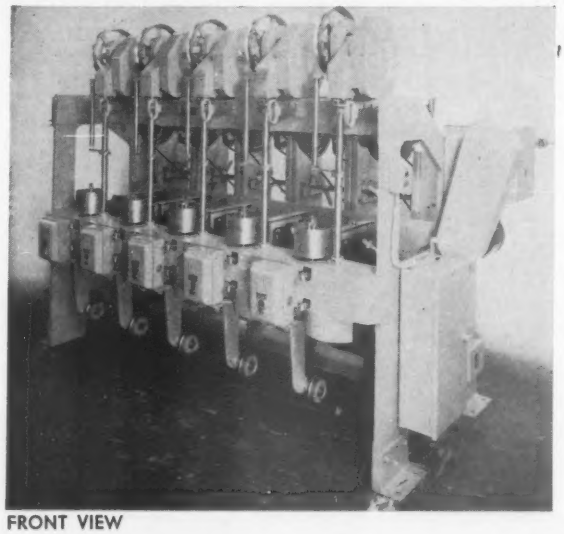
Kaiser Appointments

E. Allen Holbrook has been named marketing manager for extrusion products for **Kaiser Aluminum & Chemical Sales, Inc.,** Oakland, Cal. it has been announced by **John E. Menz,** vice president and general manager of the Industrial Division. Also announced was the appointment of **W. H. Grimm** as product manager of extrusions at the company's general sales offices in Chicago.

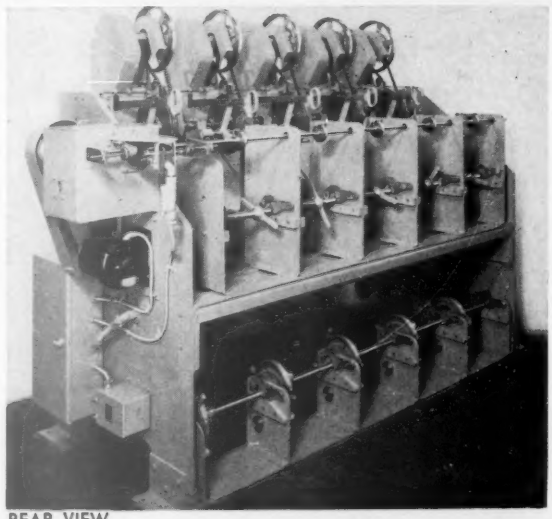
New Testers for High Speed Wire Sparking

A new line of high voltage DC sparkers which permit non-destructive fault detection at wire speeds of 4000 fpm with an electrode of zero-length, is now available from **Peschel Electronics, Inc.,** Towners, RFD 1, Patterson, N. Y.

★ ★ ★



FRONT VIEW



REAR VIEW

#2S-5-MBB INSULATION WINDING MACHINE

APPLIES SINGLE COVER TO 5 LINES OF WIRE SIMULTANEOUSLY. NOMINAL WIRE RANGE #15 TO #25 B & S GAUGES (.057" TO .018" OR 1.450 TO .455MM). STANDARD CAPSTANS 8" DIAMETER, BUT MACHINE ILLUSTRATED IS SPECIALLY ARRANGED WITH 12" DIAMETER CAPSTANS, IN PLACE OF STANDARD 8", FOR HEAVIER WIRES. SUPPLY WIRE LET-OFFS AND TAKE-UPS ARE AT REAR OF MACHINE.

EST. 1855 AIMco INC. 1915

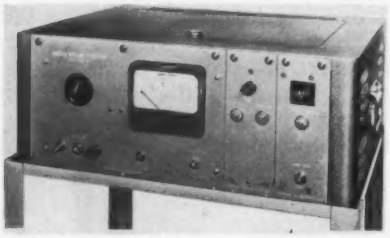
"American" AIM INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

FAIRHILL AND HUNTINGDON STREETS

PHILADELPHIA 33 PENNSYLVANIA U.S.A.

These new sparkers, type CVX, provide an entirely new concept in wire sparking. Because higher wire speeds are possible, wire making efficiency is increased and better quality control can be maintained. Non-destructive testing sharply reduces wire rejections,



Type CVX DC Sparker. * * * * *

eliminates repetitive testing with conventional AC test sets and improves quality control.

★ ★ ★

Zero length electrodes save floor space in a wire line usually necessary for a 36" long electrode. Usual AC sparkers supplied with extruders are large units with some destructive power, particularly for small plastic covered hook-up wire, nor do they have the sensitivity and speed of response, even at low speeds, to detect and register all faults. Long electrodes also may miss 60% of the faults, tests have shown.

★ ★ ★

The CVX tester features:

- **Positive fault detection at wire speeds of 4000 fpm with zero-length electrodes.**
- **100% accuracy of fault detection.**
- **Non-destructive testing.**
- **Safe, non-lethal operation.**
- **Sectionalized construction and supervisory test circuits for easy maintenance.**

★ ★ ★

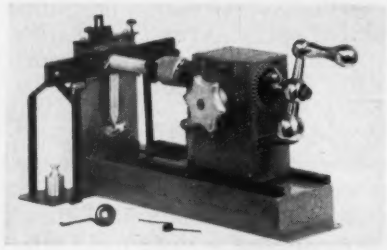
Full information will be supplied by Peschel Electronics, Inc. upon request.

New Torque Testing Instrument or Checking Torsion Springs

This new instrument checks torque in inch pounds and deflection in degrees of all types of torsion springs including coil, spiral and clock springs. Adapters can also be provided to twist straight lengths of wire to determine their torsional elastic limit.

★ ★ ★

It is equipped with a set of 15 arbors and adapters so all types of springs in a wide variety of



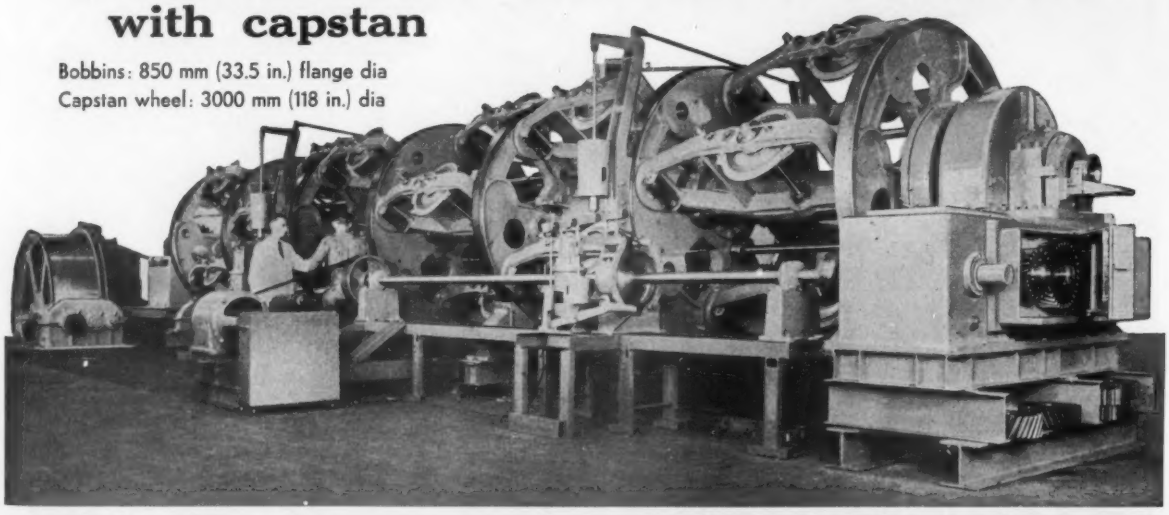
sizes can be tested easily and quickly. A set of brass weights marked to show torque in inch ounces and inch pounds and a full range 360 degree protractor dial marked in degrees provide complete test data without making calculations.

★ ★ ★

Springs made from wire diame-

24-bobbin CAGE STRANDING MACHINE with capstan

Bobbins: 850 mm (33.5 in.) flange dia
Capstan wheel: 3000 mm (118 in.) dia



J. A. KRAFT MASCHINENFABRIK, OLPE/WESTF., GERMANY
HANCOR, INC., 468 Fourth Ave., New York 16, N. Y.
SOLE REPRESENTATIVE IN THE U.S.A. AND CANADA

ters up to ⅛ in., with torques from ½ in.-oz. to 48 in.-lbs. can be checked at speeds up to 400 tests per hour.

★ ★ ★

For further information, write **The Carlson Co.,** 3457 Weidner Ave., Oceanside, L.I., N.Y.

Phosphate Coating For Steel

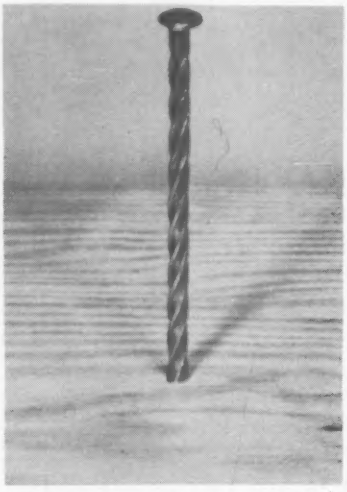
A new 4-page color brochure describing various phosphate coatings on steel for bonding paint and protecting the metal from underfilm corrosion. These coatings can be easily and economically applied to the surfaces by dipping, spraying, or brushing. Write to **American Chemical Paint Company,** Ambler, Pa.

Ardox Nails Supplied with Ready-Cut Houses

The Lewis Manufacturing Co., Bay City, Mich., original manufacturer of ready-cut homes, is now shipping a new type of nail in its building package.

★ ★ ★

The new type of nail the Ardox spiral nail, was introduced to the United States market in 1956 by **Jones & Laughlin Steel Corp.** It has 50% to 200% more holding power than the common nail. It was developed originally by The Steel Company of Canada Ltd.



Ardox Nail * * * * * * *

Cleveland Crane Builds New Plant

Ground has been broken for a new 11,400 sq. ft. Research and Development Building at **The Cleveland Crane & Engineering Co.,** Wickliffe, Ohio.

★ ★ ★

The building will include a modernly equipped air-conditioned engineering department and complete shop and testing facilities for assembling, handling and testing equipment under development.

★ ★ ★

The new building, which is scheduled for completion in June, will be a tremendous asset for accelerating the development of ideas for product improvement, as well as for completely new products and production methods.

★ ★ ★

Cleveland Crane manufacturers heavy overhead traveling cranes, Cleveland Tramrail overhead materials handling equipment, heavy Steelweld metal-cutting shears, Steelweld press brakes and forming presses.

Use the CRUM CALCULATOR for Die Sizes

Provides quick and accurate information on die sizes and reduction areas.

Calculates wire production rates for various speeds and efficiencies.

OTHER FEATURES

- Determines small percentages accurately.
- Readings in B & S gauges.
- Legible % draft-per-hole scale.
- Rectangular back protects calculator.
- Plastic construction resists wear, perspiration warping and dirt.
- Fits in a vest pocket.
- Steel, copper and aluminum lb/ft scale.
- Durable and easy to use.

SAVES TIME, MONEY AND TEMPER

INSTRUCTION SHEET FURNISHED

THE PRICE: $5.00 EACH

Send orders to

WIRE AND WIRE PRODUCTS

Exclusive Distributors

453 MAIN STREET STAMFORD, CONN.

ALUMINUM INGOT AND MILL PRODUCTS AND MAGNESIUM MILL PRODUCTS: JANUARY 1958

(Shipments and receipts are in thousands of pounds)

Item	Number of companies reporting shipments	January 1958			December* 1957 - net shipments	January 1957 net shipments
		Gross[1] shipments	Receipts[2]	Net[3] shipments		
ALUMINUM PIG AND INGOT, TOTAL	89	156,133	80,738	75,395	114,567	95,708
ALUMINUM MILL PRODUCTS, TOTAL	159	208,674	15,266	193,408	177,520	234,947
Sheet and plate, non-heat-treatable	27	78,946	11,195	67,751	59,554	80,169
Sheet and plate, heat-treatable	5	(D)	(D)	16,458	13,597	27,341
Foil, including foil in lamination	14	(D)	(D)	17,832	16,870	18,007
Rolled, and continuous cast, rod and bar[4]	6	9,765	3,190	6,575	6,032	9,726
Wire, bar, conductor and nonconductor	16	3,720	138	3,582	3,338	4,531
ACSR and aluminum cable, bare	11	(D)	(D)	13,657	14,113	17,015
Wire and cable, insulated or covered	15	(D)	(D)	4,676	3,912	5,272
Extruded shapes, soft alloys	99	48,848	643	48,205	46,742	48,772
Extruded shapes, hard alloys	9	2,877	...	2,877	2,823	7,224
Drawn tube, soft alloys	13	4,782	...	4,782	4,035	5,321
Drawn tube, hard alloys						
Welded tube, non-heat-treatable	7	1,171	...	1,171	672	[5]2,909
Powder and paste						
Atomized and grained powder	3	384	...	384	524	676
Flaked powder	5	289	...	289	259	400
Paste	5	865	...	865	697	894
Forgings (including impact extrusions)	14	4,304	...	4,304	4,352	6,689
MAGNESIUM MILL PRODUCTS, TOTAL	10	(D)	(D)	1,271	1,102	2,130

*Revised.

D Withheld to avoid disclosing figures of individual companies. These figures are included, however, in the appropriate total.

[1]Gross shipments of mill products represent total shipments by producers to customers, including other producers, and shipments by producers to their own fabricating departments which manufacture products beyond the level of mill shapes. Ingot gross shipments include shipments by importers.

[2]For mill products, represents receipts from domestic producers only. In addition to receipts from domestic producers, 114,000 pounds of mill shapes were received through imports. For ingot, receipts from imports are included.

[3]For mill products, derived by subtracting the sum of producer's domestic receipts of each mill shape from the industry's gross shipments of that shape. Ingot data derived by subtracting all receipts from shipments reported.

[4]Includes a small amount of rolled structural shapes.

[5]Includes a small amount of welded tube, heat-treatable.

ROLLER BEARING

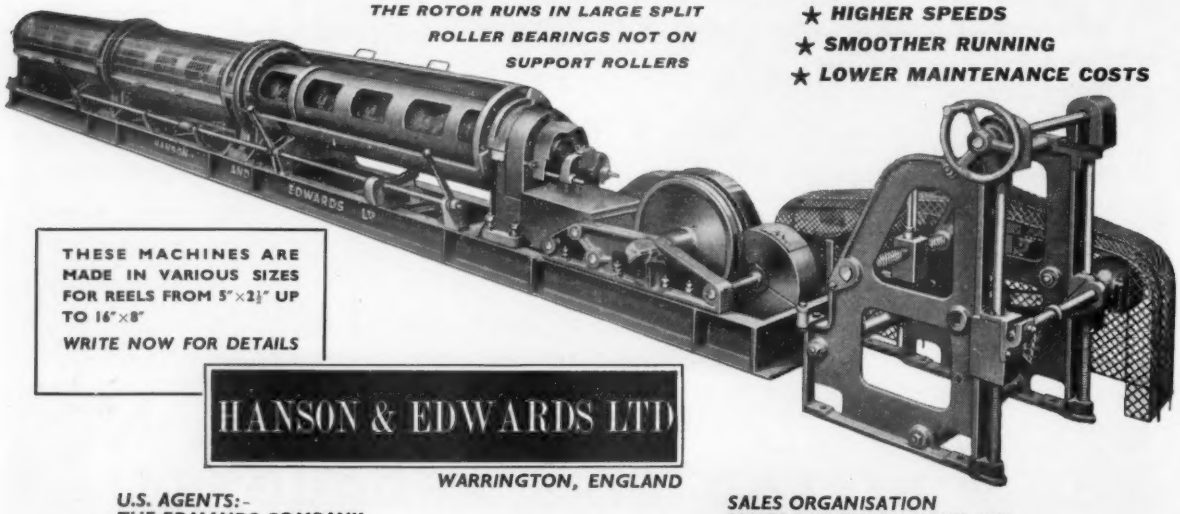
TYPE TUBULAR

STRANDING MACHINE

(EITHER SINGLE OR DOUBLE CAPSTAN)

THE ROTOR RUNS IN LARGE SPLIT ROLLER BEARINGS NOT ON SUPPORT ROLLERS

★ HIGHER SPEEDS
★ SMOOTHER RUNNING
★ LOWER MAINTENANCE COSTS



THESE MACHINES ARE MADE IN VARIOUS SIZES FOR REELS FROM 5"×2½" UP TO 16"×8"

WRITE NOW FOR DETAILS

HANSON & EDWARDS LTD

WARRINGTON, ENGLAND

U.S. AGENTS:-
THE EDMANDS COMPANY
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SALES ORGANISATION
JAMES DAY (MACHINERY) LTD.
28 MADDOX STREET
LONDON, W.1.

P 1686

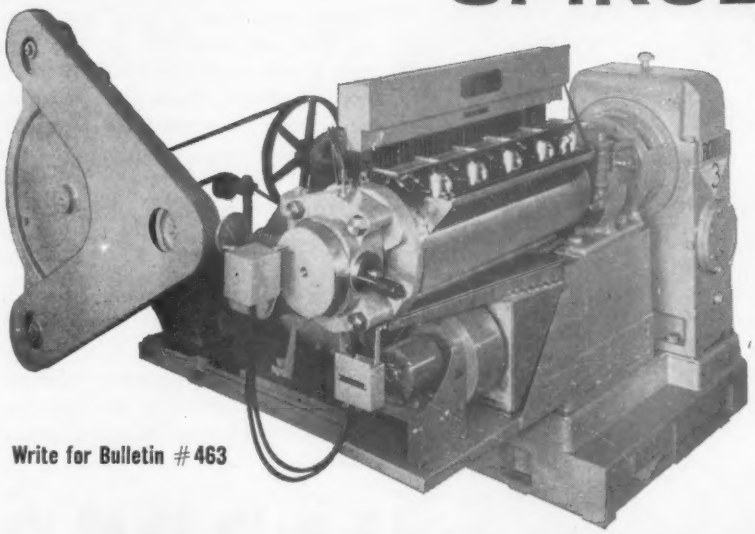
COPPER - Consumption of refined copper in the United States, in 1957 and January 1958, in short tons

	Wire mills 1/	Brass mills 2/	Chemical plants	Secondary copper smelters	Foundries and miscellaneous	Total
January-December:						
Cathodes	5,641	87,451	(3)	659	(3)	93,751
Wire bars	753,108	57,417	(3)	-----	(3)	810,525
Ingots and ingot bars	15,540	75,638	(3)	1,685	(3)	92,863
Cakes and slabs	-------	158,343	(3)	15	(3)	158,358
Billets	-------	157,102	(3)	-----	(3)	157,102
Other	791	-------	(3)	621	(3)	1,412
Total	775,080	535,951	(4)	2,980	(4)	4/1,350,011
January:						
Cathodes	503	7,527	(3)	61	(3)	8,091
Wire bars	58,177	3,720	(3)	-----	(3)	61,897
Ingots and ingot bars	1,464	4,518	(3)	176	(3)	6,158
Cakes and slabs	-------	11,545	(3)	1	(3)	11,546
Billets	-------	13,124	(3)	-----	(3)	13,124
Other	94	-------	(3)	30	(3)	124
Total	60,238	40,434	(4)	268	(4)	4/103,940

1/ Includes all wire mills with rod-rolling facilities. 2/ Includes all brass mills using copper in refinery shapes; some have rod-rolling facilities. 3/ Not available. 4/ Consumption by chemical plants, foundries, and miscellaneous plants not included. Estimate of 36,000 tons included in total for 1957, and 3,000 tons for January 1958.

ROYLE

SPIROD® for Rubber or Plastic Wire Insulating



Write for Bulletin #463

These all electric extruders with radiant heat and high velocity evaporative cooling are designed to process either plastic or rubber compounds. The result of more than three quarters of a century of experience — Royle pioneered the extrusion process in 1880— in the design and construction of extruding machines time tested features have been built into Spirod to assure dependability.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — Hyde Park 2430 - 0456

Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262

Akron, Ohio — J. C. Clinefelter Co. — BLackstone 3-9222

Downey, Cal. — H. M. Royal, Inc. — TOpaz 1-0371

Tokyo, Japan — Okura Trading Co., Ltd. — (56) 2130 - 2149

AMERICAN IRON AND STEEL INSTITUTE
150 EAST FORTY-SECOND STREET, NEW YORK 17, N. Y.

AIS 10

Total Number of Companies Included 124

FEBRUARY (Month) - 1958

SHIPMENTS OF STEEL PRODUCTS
ALL GRADES INCLUDING CARBON, ALLOY AND STAINLESS
(Net Tons)

Covering Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or for Resale)

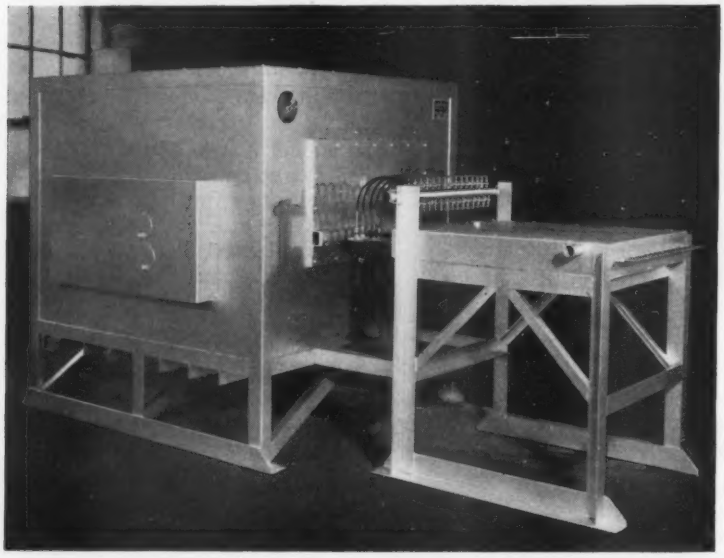
Steel Products	Item	CURRENT MONTH 1958 Carbon	Alloy	Stainless	Total	Percent of Total Shipments	Prior Year (1957) Percent of Total Shipments	YEAR TO DATE 1958 Carbon	Alloy	Stainless	Total	Percent of Total Shipments	Prior Year (1957) Percent of Total Shipments
Ingots and Steel Castings	1A	10,527	10,129	1,559	22,215	0.5	0.7	22,369	20,933	3,135	46,437	0.5	0.6
Blooms, slabs, billets, sheet bars	1B	74,582	19,005	920	94,507	2.2	2.8	157,517	* 47,894	2,129	* 207,540	2.2	2.7
Tube rounds	1C	567	128	-	695	-	0.1	939	* 364	-	* 1,303	-	0.1
Skelp	2	5,977	-	-	5,977	0.2	0.3	11,512	-	-	11,512	0.1	0.3
Wire rods	3	59,288	1,115	358	60,761	1.4	1.2	* 120,374	2,359	684	* 123,417	1.3	1.3
TOTAL SEMI-FINISHED		150,941	30,377	2,837	184,155	4.3	5.1	* 312,711	71,550	5,948	* 390,209	4.1	5.0
Bars—Hot rolled (incl. light shapes)	14	301,453	80,533	2,891	384,877	9.0	10.1	* 661,939	186,211	5,646	* 853,796	9.0	10.2
Bars—Reinforcing	15	106,600	-	-	106,600	2.5	3.3	224,803	-	-	224,803	2.4	3.1
Bars—Cold finished	16	61,497	10,191	2,946	74,634	1.8	1.8	133,956	23,299	6,540	163,795	1.7	1.8
Tool steel	17	632	4,997	-	5,629	0.1	0.1	1,431	10,747	-	12,178	0.1	0.1
TOTAL BARS AND TOOL STEEL		470,182	95,721	5,837	571,740	13.4	15.3	* 1,022,129	220,257	12,186	* 1,254,572	13.2	15.2
Wire—Drawn	23	148,816	2,751	1,497	153,064	3.6	3.1	* 325,546	6,165	3,224	* 334,935	3.5	3.1
Wire—Nails & staples	24	28,131	-	1	28,132	0.7	0.5	60,325	-	3	60,328	0.6	0.5
Wire—Barbed & twisted	25	4,827	-	-	4,827	0.1	0.1	9,200	-	-	9,200	0.1	0.1
Wire—Woven wire fence	26	14,473	-	-	14,473	0.3	0.3	29,041	-	-	29,041	0.3	0.3
Wire—Bale ties & baling wire	27	3,009	-	-	3,009	0.1	0.1	* 4,498	-	-	* 4,498	0.1	-
TOTAL WIRE & WIRE PRODUCTS		199,256	2,751	1,498	203,505	4.8	4.1	* 428,610	6,165	3,227	* 438,002	4.6	4.0
Sheets—Hot rolled	31	417,342	14,504	2,901	435,147	10.2	10.4	903,473	35,910	* 5,661	* 945,044	10.0	10.6
Sheets—Cold rolled	32	692,322	2,402	7,351	702,075	16.5	15.3	1,553,979	5,519	15,916	1,575,411	16.6	15.6
Sheets—Galvanized	33	167,627	-	-	167,627	3.9	2.9	354,276	-	-	354,276	3.7	3.0
Sheets—All other coated	34	12,005	-	-	12,005	0.3	0.3	28,504	-	-	28,504	0.3	0.2
Electrical sheets & strip	35	3,267	32,483	-	35,750	0.8	0.8	10,377	63,682	-	74,059	0.8	0.8
Strip—Hot rolled	36	64,410	1,210	631	66,251	1.6	2.0	145,120	2,633	1,285	149,038	1.6	2.0
Strip—Cold rolled	37	68,368	1,677	10,183	80,228	1.9	1.5	* 145,741	* 3,558	24,032	173,331	1.8	1.6
TOTAL SHEETS AND STRIP		1,425,341	52,676	21,066	1,499,083	35.2	33.2	* 3,141,467	*111,302	* 46,894	* 3,299,663	34.8	33.8
TOTAL SHIPMENTS (1958)		3,967,842	259,924	35,169	4,262,935	100.0	xxx	* 8,832,443	*570,250	* 76,061	* 9,478,754	100.0	xxx
TOTAL — PRIOR YEAR (1957)		6,582,506	425,051	59,175	7,066,732	xxx	100.0	13,844,409	907,203	124,517	14,876,129	xxx	100.0

* Revised

4358

HARPER STRAND ANNEALER

delivers bright stainless wire continuously at high speeds



Operating at temperatures from 2000°F. to 2200°F., this 30 tube Harper Electric Strand Annealing Furnace turns out Type 304SS wire bright and clean. Sizes from .02" to .0014" are passed through its 40" hot zone at rates up to 100 FPM per tube.

Providing close temperature control, Harper Strand Annealers maintain extremely dry reducing atmospheres to produce a truly bright finish. Designed for dependable, trouble-free performance over long periods, they permit wire speeds up to 150 FPM per tube.

Harper manufactures a full line of automatic conveyor, continuous tube, and bell type annealing furnaces for billets, bars, rods and wire. To solve your wire problem most profitably, call in a Harper engineer or write: Harper Electric Furnace Corporation, 42 River St., Buffalo 2, N.Y

HARPER
ELECTRIC FURNACES

Welding Wire Comparison Chart

An informative and useful 4-page folder, designated as DH-1218-M, has been prepared by the **Page Steel and Wire Division, American Chain & Cable Company, Inc.,** Monessen, Pa. It replaces DH-1218-L issued last year because of recent analysis changes in automatic welding and metal spray wire.

★ ★ ★

The bulletin details "as-welded" physical properties, gives analysis, tensile strength, elongation, average Rockwell hardness indications and lists typical uses for gas welding rods, bare electrodes, automatic welding wire and metal spray wire. Comparison between Page welding products and virtually all competitive makes have been listed for close study.

Electronic Gauge Holds Insulated Cable Diameters to Close Tolerances

Industrial Gauges Corporation, West Englewood, N. J., announces an electronic gauge which continuously measures the diameter of insulated cable as insulation is applied, and controls production equipment to hold the diameter within close tolerances. The gauge conserves insulating materials by preventing oversize diameters and improves cable quality by avoiding undersize dimensions.

★ ★ ★

Known as the Microlimit Control Cable Gauge, the instrument signals control equipment when diameter deviations exceed preset limits, and this equipment activates extruder or capstan so that more or less insulating material is applied as required. Diameters are controlled to within two thousandths of an inch.

★ ★ ★

For additional information write to Industrial Gauges Corporation, West Englewood, N. J.

New Horizontal Tube Block

The Fenn Manufacturing Company, a leading producer of metal forming equipment has recently

When your problem is

WIRE DRAWING LUBRICANTS
(Copper, Alloys or Aluminum)

ELEVATOR or AIRCRAFT CABLE SHIELD

The experience of our engineers, internationally known specialists in lubrication, is available to you without cost. Write us. The Ironsides Company, Columbus 16, Ohio.

also producers of weatherproof and flame-resistant wire coatings

SHIELD PRODUCTS

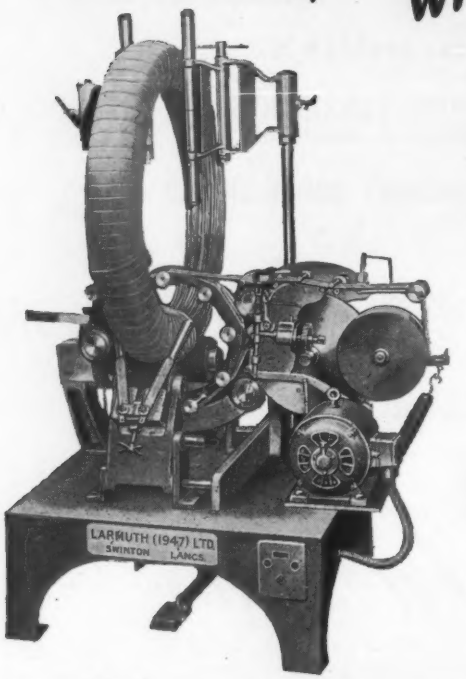
Ironsides

AT YOUR SERVICE

SPECIALIZED ENGINEERING
SPECIALIZED EXPERIENCE
SPECIALIZED MACHINERY
FOR
TWISTING • STRANDING • BUNCHING
Continuous Tension Control
For Precision-Quality

HASKELL-DAWES
MACHINE CO., INC.
2231 E. Ontario Street
Philadelphia 34, Pa.

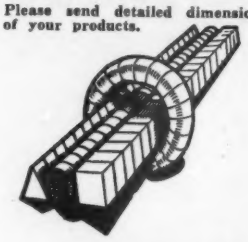
LARMUTH *Spiral Wrapping* MACHINES



are built to finest British engineering standards and are in use throughout the world for spiral wrapping of Motor Tyres, coils of Wire, Strip, etc., from 3" bore upwards. Also straight length Tubes, Bars, Rods, etc.

"BOUND" to get there safely.

Please send detailed dimensions of your products.



LARMUTH *of England*

U.S.A. Agents: Machinery & Machine Supplies Co., Inc.
305 East 47th St.,
New York 17, N. Y.
Telephone: Plaza 8-0744-5-6-7

LARMUTH (1947) LTD., EAST LANCASHIRE ROAD, SWINTON, MANCHESTER, ENGLAND.
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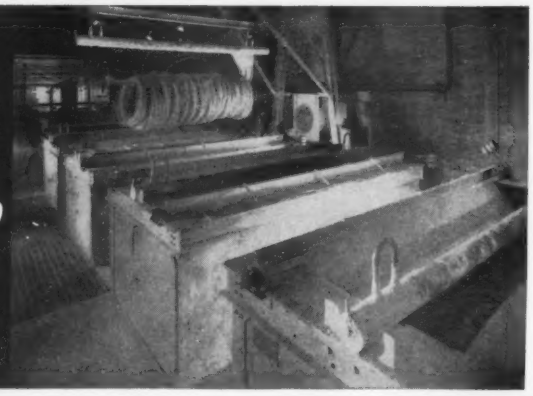
carl mayer

HI-SPEED REGISTERED

ROD BAKERS



Faster baking, greater fuel economy, maximum production efficiency are just a few of the results of the exclusive heating arrangement of the Carl Mayer Hi-Speed Rod Baker. It also has a patented blow-off feature which removes moisture without damage to coils.

Here are just a few of our many satisfied customers:

American Steel & Wire Co.
Atlas Steel Co.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America
Driver-Harris Co.
B. Greening Wire Co., Ltd.
Indiana Steel & Wire Co.
Jones & Laughlin Steel Corp.
Republic Steel Corp.
Sheffield Steel Div., Armco Steel Corp.
Steel Company of Canada

Write for Bulletin No. 350

Patent Nos.
U. S. A. 2,296,361
2,323,828
2,235,559
Canada 396,144
401,589

THE **carl mayer** CORP.
20800 CENTER RIDGE RD., CLEVELAND 16, OHIO

OTHER PRODUCTS: Core Ovens • Mold Ovens • Welding Rod Ovens • Heat Treating Ovens & Furnaces • Special Processing Equipment and Accessories.

installed a Model H-48T Horizontal Tube Block at one of the East's largest nonferrous tube drawing plants. The machine is equipped with a 36" diameter block and is driven by a 75 HP variable speed DC motor. The block is capable of drawing nonferrous tubing at speeds up to 1350 fpm. For information on Fenn Tube Block, write to The Fenn Manufacturing Company, Newington, Conn.

1200°F Wire Insulation

Development of a ceramic insulating material reported to be capable of withstanding temperatures up to 1200° F. has been announced here by **Secon Metals Corporation,** White Plains, N. Y.

★ ★ ★

The demand for ever higher operating temperatures for electronic components led Secon to develop the insulating material for high temperature resistance and magnet wires. The insulation is a ceramic material that firmly adheres to all common resistance and magnet wires.

★ ★ ★

Due to the complexity of operating at the higher temperatures, there is no standard base wire upon which this insulation is applied, and consequently each order is engineered to individual requirements.

New Aluminum Processing Plant for Canada

A new company is to be formed to manufacture aluminum wire and cable in Canada, to be known as **Phillips CBA Conductors Ltd.** It is a joint enterprise of **Phillips Electrical Company Ltd.** and **Canadian British Aluminum Company Ltd.** This combines an assured source of raw materials with Phillips' manufacturing facilities.

★ ★ ★

Located in Brockville, the new venture will have access to railways, the Seaway, and the main highway to the markets of Canada. This arrangement will provide excellent distribution facilities, as well as being adjacent to the Phillips' plant for administration and operational purposes.

When incorporated, the new concern will be managed by Phillips Electrical Co. It is planned to manufacture aluminum rod, wire and cable, including ACSR for power transmission.

New Motors Announced

Reliance Electric & Engineering Company, 24701 Euclid Ave., Cleveland 17, Ohio, has announced three new types of electric motors.

1. **A line of ¾ to 15 hp submersible motors to operate in liquids for pumping;**
2. **A line of ¾ to 15 hp polyphase motors of sleeve bearing type for air conditioning and pumping applications; and**
3. **New vertical solid shaft, high-thrust motors up to 40 hp for pumps.**

★ ★ ★

Detailed information on any or all of these will be sent upon request.

Publishes Spring Digest

Miller & Van Winkle, 156 Sherman Ave., Paterson, N. J., producers of precision compression, extension, and torsion springs, have issued a new manual called the "Spring Digest" which will be mailed upon request.

★ ★ ★

The company was established in 1884 and makes springs from wire of hair thickness to 2 inches in rod diameter of steel and alloy materials.

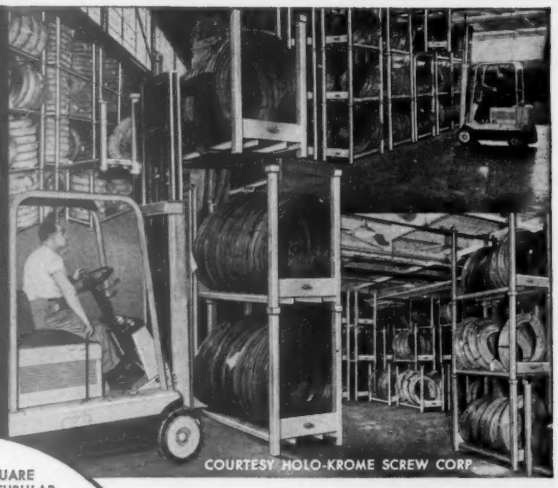
Bulletin on Wire and Cable

The Boston Insulated Wire and Cable Co., 65 Bay St., Boston 25, Mass., has issued a 12 page bulletin describing its engineering and production facilities for wire and cable manufacture and describing its line of these products. The bulletin is well illustrated.

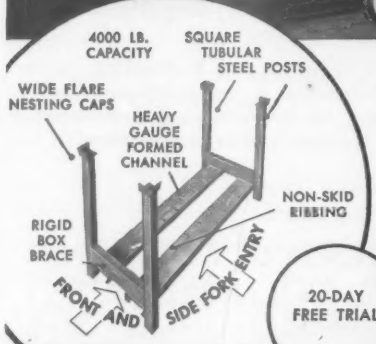
★ ★ ★

On page 8 is a table of comparative characteristics of cable insulations, that it considers the most complete and concise presentation of properties available. By reference to it, determination of types of coatings suitable for end-uses may be made. Three pages are devoted to types of cable constructions.

JARKE
PORTABLE
WIRE COIL RACKS



COURTESY HOLO-KROME SCREW CORP.



Solve Wire Coil Storage Problems

Makes handling and storing of unwieldy wire coils a simple one-man operation. Improves plant housekeeping, saves space, provides positive inventory control. Front and side fork entry permits closer stacking and greater maneuverability in narrow aisles. Saves time, labor, cuts costs. Standard and special sizes.

20-DAY FREE TRIAL

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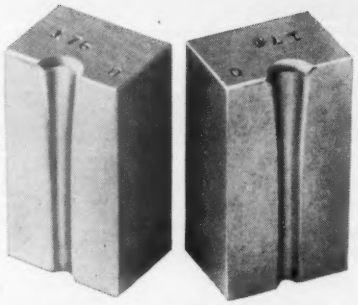
MODULAR STORAGE SYSTEMS FOR METAL INDUSTRY • STEELMOBILE

Sjogren POINTING DIES

SJOGREN Pointing Dies have proven themselves! Made from shock-resisting high grade steel they assure many hours of hard, continuous usage. Fit your swaging machines with these rugged, S & S Pointing Dies, made to order on your specifications, they guarantee you service.



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Used by Wire Men Who Want the Best!

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TOOL & MACHINE CO., INC.

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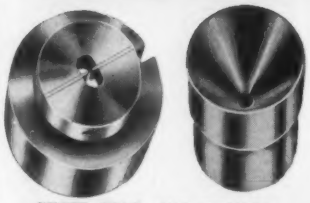
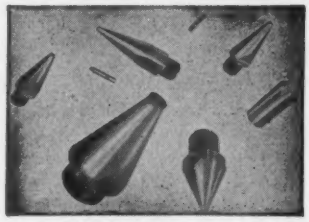
INSULATING DIES AND NOZZLES
for EXTRA-HIGH ELECTRIC WIRE PRODUCTION

CARBIDE AND STEEL

Highest Quality Workmanship and Materials. Standard Types and Special.



STEEL DIES—ALL SHAPES.



CARBIDE EXTRUSION NOZZLES OR TIPS FOR ALL MACHINES.

BRIDGEPORT CARBIDE NOZZLES have phenomenally long life, will lower operating costs and reduce wire breakage.

BRIDGEPORT STEEL DIES are made in Round, Figure 8, Serrated, Tracer and other Special Shapes to your specifications. A newly designed Tru-Rip Die Assembly can be taken apart, cleaned, blades changed and reassembled quickly and easily. Made for 2 and 3 conductor wires to be coated in extrusion machines.

Write for folder or phone for information

WIRE TOOL DIVISION

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Export Dept. ANDOVER INTERNATIONAL INC., P.O. Box 29, Bayside 61, N. Y.

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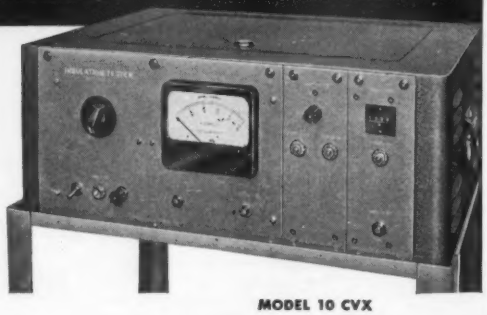
LEADER IN HIGH PRODUCTION EXTRUSION TOOLS FOR ELECTRIC WIRE

FAST WIRE SPARKING with PESCHEL DC TESTERS

Electrode of only 1-inch length permits non-destructive fault detection at production rates to 4000 fpm



MODEL 10 CVX

This High Voltage DC Insulation Tester is ideal for use with extruders, vulcanizers or twinners. May be used to replace AC sparkers where 0-10KV DC is ample (20KV models also available).

Accurate, efficient detection, indication and recording of every fault is assured, without burning or marking insulation. Safe and easy operation by unskilled personnel. "Zero-length" electrodes (1" and shorter!) conserve floor space. Supervisory circuits and sectionalized construction facilitate servicing.

For complete technical data, write TODAY to:

PESCHEL ELECTRONICS, INC.

Towners, R.F.D. 1, Patterson, N. Y. • Tel.: TRinity 8-3251

A copy will be mailed upon request to the company.

Handbook on Aluminum Chemicals

A basic handbook on industrial applications of aluminum chemicals has been published by **Reynolds Metals Company,** considered to be the most comprehensive technical publication in its field.

★ ★ ★

The 48-page color-illustrated book summarizes the technology of present applications and suggests new uses for the wide variety of chemicals produced by the aluminum industry. It includes information on sources of aluminum chemicals, major uses, products and quality control facilities. The publication has tables and charts on useful technical data.

★ ★ ★

Technical information on aluminum chemicals covers calcined, fused and activated bauxite; hydrated, calcined, activated and fused aluminas; aluminum powders and pastes; and aluminum drosses and slags.

★ ★ ★

Copies of the handbook are available upon letterhead request to Reynolds Metals Company, 2500 South Third Street, Louisville 1, Ky.

New Reference Lists on Cobalt

The Cobalt Information Center, Battelle Memorial Institute, announces the availability of three new reference lists, "Aluminum-Cobalt Alloys," "Cobalt in Cast Iron," and "Cobalt in Stainless Steel."

★ ★ ★

These publications may be obtained by addressing requests on company letterhead to the Cobalt Information Center, % Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio.

Gem Gravure Opens West Coast Branch

The Gem Gravure Company, Inc. West Hanover, Mass., U. S. A.,

manufacturers of Marking Machines, Inks and Wheels, announces the opening of a West Coast Branch. All inquiries West of the Rockies and Mexico will be handled by **Kenneth E. Coombs,** P.O. Box 15, Sunnyside, San Diego County, Calif.

New Insulating Material

A new thermosetting compound, Vulkene, has been developed by **General Electric's Wire and Cable Department** and is being used as insulation for its line of service drop and aerial secondary cables rated at 75 C, 600 volts.

★ ★ ★

The product involves filling and cross-linking the molecules of polyethylene, to make a thermosetting material with short-time temperature characteristics far in excess of those of conventional polyethylene, that will withstand short circuits or occasional overload situations. They possess good dimensional stability at elevated temperatures.

★ ★ ★

Excellent resistance to abrasion, impact, and high insulation resistance are other features. Vulkene cables, compared to neoprene or other thermosetting rubber cables, are lighter in weight and smaller in diameter, making them easier to handle and permitting less sag or longer spans. They are available in standard sizes with copper or aluminum conductors.

Guide to Bar Selection

A new thirty-page illustrated brochure that serves as a guide to the proper selection of cold finished bar products is now available from the **Union Drawn Division** of **Republic Steel Corporation,** Massillon, Ohio.

★ ★ ★

The booklet offers tips and technical data on carbon steels, free machining steels, stress relief annealed steels, leaded steels, and alloy and stainless steels. Information is also included on carbon corrections, special sections, turned, ground and polished bars, and the furnace treatment of cold finished products.

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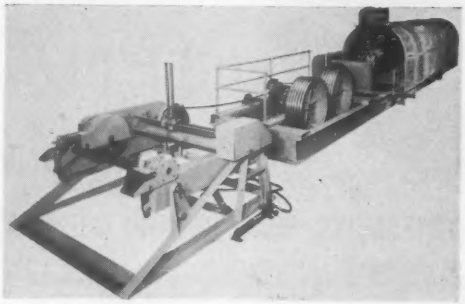

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The advantages of cold drawing steel bars through dies of the proper shape are described. These include: bright, smooth finish free from scale and surface imperfections; accuracy; straightness; superior machinability; and improved mechanical properties.

J&L to Drawn Stainless Steel

The Stainless Steel Division of **Jones & Laughlin Steel Corporation** began the manufacture of stainless steel wire in April at its new wire mill in Warren, Michigan.

★ ★ ★

The mill will produce stainless wire in sizes ranging from ⅛ inch to ½ inch in coils or straight lengths. Four finishes will be available: cold drawn; copper-coated and cold drawn; special non-metallic coatings; and centerless ground. Standard 300 and 400 grades will be made.

★ ★ ★

Among the many applications of the stainless wire to be produced at J&L's new mill are cold heading wire, spring wire, welding wire in smaller sizes, weaving wire, forming wire, rope wire, belt wire, and slide forming wire.

★ ★ ★

The new half-million-dollar wire mill is an integral part of J&L Stainless Division's main plant and offices at Eight Mile and Mound Roads in Warren, Michigan, a suburb of Detroit.

★ ★ ★

Major items of equipment installed at J&L's new wire mill include: one Vaughn No. 4 Special Motoblox cold drawing bench; one Vaughn No. 22 Single Deck Motobloc cold drawing bench; two Hartform wire draw benches; one complete Drever copper coating line; two Lewis spin straighteners; one Micro Welder; and two Landis continuous pointers. Overhead and wall cranes will handle material.

NEMA Publishes Guide to Standards

The latest edition of "Your

Guide to NEMA Standards Publications"—a 17-page booklet describing 150 Standards Publications developed by Subdivisions of the **National Electrical Manufacturers Association** is available without charge from the Association's headquarters, 155 East 44th Street, New York 17, N. Y.

★ ★ ★

New product standards are developed and existing standards revised by various NEMA Sections as need arises. Standards Publications undergo constant revision and reprinting. The new Guide, for example, contains information about nine new and thirteen revised standards.

★ ★ ★

Many NEMA Standards Publications are sold with provision for an automatic revision service. Purchasers of these Publications receive revisions regularly without additional charge during the life of the publication. A price list of the NEMA Publications is included with each Guide.

Folder on Force Gages

An illustrated six-page folder describing its line of mechanical force gauges has been issued by **W. C. Dillon & Co., Inc.**, manufacturer of testing instruments. Comprised of action photographs of Dillon Force Gauges in actual use, the folder also includes complete specifications, dimensions and capacities.

★ ★ ★

Available in twelve capacities from 0-10 to 0-50,000 pounds, Dillon Force Gauges can be used alone or added to special testing devices for the precise measurement of pressure, tensile or torque. The instruments will flex millions of cycles without loss of resiliency and are accurate to within plus or minus one per cent.

★ ★ ★

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Line of Wire Products Results from Parent's Exasperation

(*Continued from page* 547)

"At home" furniture items are also produced by the Peterson Company. Swing sets, convertible high chairs and utility stools are also being shipped to every state and even abroad. Stylizing is important too. Some high chair models use brass plated wire to carry out a provincial theme.

★ ★ ★

The versatility of specialty steels has been utilized by the company, even for the smallest parts. Fabrication of the bead rack for baby's entertainment uses electrolitically zinc-coated Bethanized wire. Requiring a sharp bend to "keep" the beads, the wire retains its protective coating requiring no further finishing before assembly to reduce manufacturing time.

★ ★ ★

Baby also has even better things to look forward to in his or her (or both) travels. Several accessories have been introduced by the Company that include rumble seats, step attachments for the high chair as the youngster grows, a Folda car seat and even an all-weather shield for the Folda vehicles when the weather kicks up.

★ ★ ★

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A New Instrument for Precise Measurement of Fine Wire Diameters

(*Continued from page* 543)

moved up and down the arms so that the position of the centre of gravity of the tilting beam (of which the pendulums form an integral part) may be adjusted in the vertical plane. Such adjustment facilitates the setting of a very light contact load at the anvils.

★ ★ ★

The manner in which the instrument is used depends on the type of measurement required. Two typical applications are first the determination of the absolute diameter of a wire and secondly the investigation of variation in diameter along the length of a wire.

Determination of Absolute Wire Size

For the determination of absolute size the lower anvil consists of a pile of slip gauges wrung to the base plate under the movable anvil. The reading of the autocollimator is first taken when the movable anvil rests directly on the upper surface of a slip gauge pile of height, say, h_1 in. This slip gauge pile is then replaced by another of height h_2 in. with the wire, of nominal diameter say, d in. resting on it. The height h_2 in. of the second slip gauge pile is chosen so that $h_1 = h_2 + d$. With the movable anvil now resting on the wire a second reading of the autocollimator is taken so that the difference between the two readings enables the actual diameter of the wire to be calculated.

★ ★ ★

Clearly, if an accurate result is to be obtained it must be ensured that when the moving anvil is in the measuring position on the first slip gauge pile the surfaces of anvil and slip gauge pile are accurately parrallel. This is done by lapping the contact face of the anvil in situ using a parallel faced lap located off the base plate. The height h_1 in. of the slip gauge pile is then made equal to the thickness of the lap, which is nominally

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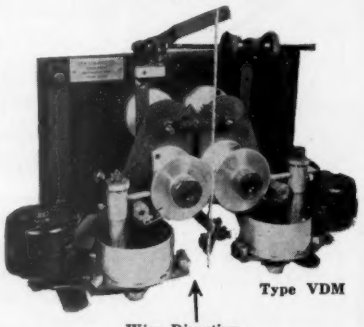

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0.5 in. (12.5 mm): It must also be ensured that the wire to be measured is in proper contact with both anvils. For this purpose the wire is mounted in a suitable fixture, an example of which is seen in Fig. 2. The position of the fixture is set by means of three adjustable feet so that the wire, lightly tensioned, lies flat across the surface of the fixed anvil and just in contact with it.

* * *

This setting must be carried out with care, particularly when a very light contact load is being used. It is not, in general, necessary that the wire should lie precisely under the centre of the moving anvil, so that positioning may conveniently be done by eye, but if this is desired it may readily be arranged by locating the fixture holding the wire against appropriately placed stops. A displacement of the wire from the central position does of course give rise to a slight change in sensitivity but since h_2 is always adjusted so that the measured quantity (given by the difference between the two readings of the autocollimator) is small, any error so introduced is negligible.

Examination for Diameter Variation

An arrangement whereby a specimen of wire may be examined for variation in diameter along its length is as follows. The instrument is set up on a surface plate with the wire mounted in a fixture which may be traversed along a straight-edge. A pointer attached to the fixture registers against a scale on the straight-edge and a series of readings at known positions along the wire may thus be obtained. For this purpose, since variation in diameter only is being measured, a fixed anvil can be used with advantage. The wire is lightly tensioned in the fixture and its position in relation to the fixed anvil is adjusted so that it is always in contact with this anvil as it is traversed. In the particular mounting fixture the clamps holding the ends of the wire may be rotated about an axis coincident with that of the wire so that variation in diameter in a diametral

section may also be investigated if so desired. (It should be noted that in actual use the instrument and straight-edge as shown in Fig. 3 should be firmly clamped to the surface plate. The necessary clamps have been omitted from the illustration in the interest of greater clarity).

★ ★ ★

The use of the instrument at the British National Physical Laboratory has so far been largely restricted to the measurement of diameter in the range 0.002 in. (0.05 mm.) to 0.006 in. (0.15 mm.) but absolute determinations of diameter have also been made successfully on wires of nominal diameter 0.00015 in. (4μ) using a contact load of about 1 gramme weight. A further application envisaged is the measurement of the diameters of small precision balls.

Acknowledgement

The work described has been carried out as part of the research programme of the National Physical Laboratory, Teddington, England, and this description of the apparatus is published by permission of the Director of the Laboratory.

Torque Values of Spring Wire Recorded

(*Continued from page* 545)

To conduct a test, the upper end of the test wire is rotated by the motor and reduction gear at an angular speed of about 100° per minute. At the same time, an interrupter and ignition coil produce sparks at 5-second intervals between the two electrodes, causing a line of small black dots to appear on the paper.

★ ★ ★

The angular deflection of the movable bar electrode is proportional to the torque applied to the measuring wire. This deflection displaces the position of the spark vertically on the paper. The position of the spark is displaced horizontally by the twist in the test wire. It is this twist in the test wire that causes rotation of the paper cylinder relative to the movable bar electrode. Thus, as the sparks pass through the paper from the fixed to the movable electrode, the torque-twist relationship of the test wire is recorded.

★ ★ ★

The machine fills a gap in the equipment now available for testing small-diameter wire. Its construction allows flexibility in the length of test wire and the torque range of the measuring wire. The device also has the advantages of low first cost and an absence of complicated accessories.

★ ★ ★

For further technical details, see "A Recording Torsion Testing Machine for Wire," by **H. C. Burnett,** ASTM Bull. (in press).

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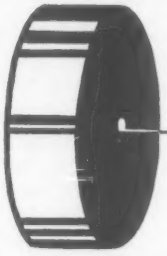

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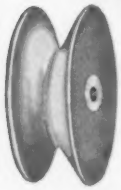

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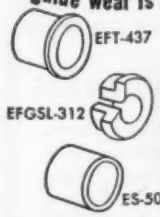

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(*Continued from page* 533)

to allow all the essential claims. As a basic patent, the breadth of the claims is considerable and should afford much more than the usual protection which is obtained with the ordinary improvements "on old art" patent.

★ ★ ★

Steel treated by this process is freed of most of the hydrogen that is nearly always present in steel as a result of acid pickling and the degassed metal is a very different material from what is now considered good steel. One of the important results, it should be repeated, is that the ductility of the metal is increased and tendencies toward work-hardening are considerably decreased, which, besides making possible a larger number of drafts prior to in-process annealing, also contributes to longer die life.

★ ★ ★

Since the process lends itself to wire, because it is produced on a continuous basis, it should have a very special interest to mills that draw wire.

Electrical Testing

(*Continued from page* 538)

through the ammeter. The current flowing through the resistance is exactly equal to that flowing through the ammeter so that its reading is precise. On the other hand, the voltage drop shown on the voltmeter is greater than that actually prevailing across R by the amount contributed by the internal resistance of the ammeter. The value of resistance based on the readings observed is

$$R'' = V_2/A_2 \qquad (3)$$

The correct value, however, is more properly expressed by

$$\begin{aligned} R &= V_2/A_2 - R_a \qquad (4) \\ &= R'' - R_a \\ &= R''(1 - R_a/R'') \end{aligned}$$

where R_a is the resistance of the ammeter. R", as implied earlier, is the uncorrected value of the re-

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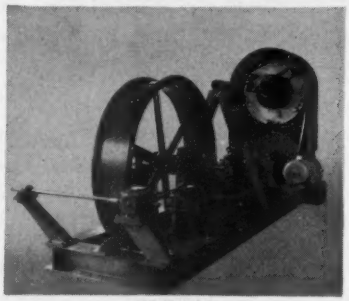

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sistance being measured and the binominal $1\text{-}R_a/R''$ is the correction factor that must be applied to obtain the true value. The smaller the value assumed by the fraction R_a/R'', the smaller is the error introduced by the instruments. To put it another way, the larger the resistance being measured compared with the internal resistance of the ammeter, the more accurate do the readings become. The criterion for accuracy, then, is:

USE THE HOOK-UP OF FIGURE II IF THE CURRENT IS SMALL FOR A LARGE VALUE OF E.

★ ★ ★

The large value of E is stipulated in order to insure that the small current is due to a high value of R rather than a small value of E.

★ ★ ★

In conclusion, we determine the conditions under which the error arising from either method of measurement is equal. For this to be true it is only necessary to set the deviations contained in each of the preceding binominals equal, i.e.,

$$R'/R_v = R_a/R''$$

It is also very nearly true that

$$R' = R'' = R$$

so that

$$R'R'' = R_aR_v = R^2$$

and

$$R = (R_aR_v)^{0.5}$$

★ ★ ★

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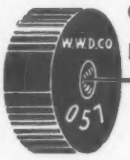

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Two New Firth Sterling Bulletins

Firth Sterling, Inc, 3113 Forbes St., Pittsburgh 30, Pa., has published a bulletin on Firthite WF, a new cermet cutting material that contains neither tungsten nor cobalt. A tool life section features a cutting speed versus tool life graph. A full page is devoted to case histories.

★ ★ ★

The company also has issued a new technical bulletin on Firth Heavy Metal, a tungsten-nickel-copper alloy, containing applications accompanied by photographs, and a pictorial purchasing aids section. Specifications are given and an extensive machining section is featured.

Rome Cable Adds Die Making Equipment

Rome Cable Corporation is adding new equipment at its main plant in Rome, N. Y., to enable it to pierce, shape, and finish diamond dies, according to vice president **Charles H. Ellis.**

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★ ★ ★

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Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Rome Soap Manufacturing Co., Rome, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.
Swift & Company, Chicago, Ill.
United States Borax & Chemical Corp., Pacific Coast Borax Co. Div., New York, N. Y.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

CONTAINERS—Wire Packaging
(See DRUMS—Wire Packaging)

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

COUNTERS—
(See MACHINERY—Measuring Wire and Cable)

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit

CUTTING TOOLS—Wire
Porter, H. K., Inc., Somerville, Mass.
Robinson, M. W. Co., Rockfall, Conn.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Research Company, St. Clair Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDER RECLAIMING—
Danforth, The C. W. Co., Youngstown, Ohio
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Research Co., St. Clair Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Cold Heading
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit

DIES—Diamond
Ajax Industrial Supplies, Inc., Ft. Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Ft. Wayne Wire Die Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES DIAMOND—Drawing Angle Controlled
Hoosier Wire Die, Inc., Ft. Wayne, Ind.

DIES DIAMOND—Reversible
National Wire Die Co., Inc., New York, N. Y.

DIES—Extrusion
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelloy Corporation, New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Polishing, Asbestos Wire
Beard Machine Co., York, Pa.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Metallurgical Products Dept. of General Electric Co., Detroit
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Hoosier Wire Die., Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRIVES—Electric, Adjustable Speed
Allis, The Louis Co., Milwaukee, Wisc.

DRUMS—Wire Packaging
Continental Can Company, Van Wert, Ohio
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.

DRUMS & TRAVERSES—For Cable Reels
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

DRYING EQUIPMENT—
Carl Mayer Corp., The, Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FREQUENCY CHANGERS—
The Louis Allis Company, Milwaukee, Wisc.

FURNACES—Brazing
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

FURNACES—Galvanizing Equipment
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Company, Philadelphia, Pa.
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

FURNACES—Resistance Heating, Strand
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

FURNACES—Salt Bath
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio

FURNACES—Strand Annealing
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)

GEARMOTORS—
The Louis Allis Company, Milwaukee, Wisc.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—For Wire
Burlington Fabricators Inc., Products Div., Burlington, N. J.
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INKS—Printing, for Insulated Wire
Chemical Products Corporation, East Providence, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.

INSULATING MATERIALS —
Blane Corporation, The, Canton, Mass.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The, Philadelphia and Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Company, Harrison, N. J.
Rome Soap Mfg. Co., Rome, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.

MACHINERY—Bobbin Winders
Hanson & Edwards, Ltd., Warrington, England
Larmuth and Bulmer, Limited, Manchester, England

MACHINERY—Bolt, Rivet, Screw, etc.
Behr Machinery & Equipment Corp., Rockford, Ill.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Braiding
New England Butt Co., Providence, R. I., Division of Wanskuck Co.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)

MACHINERY—Centerless Grinding & Polishing
American Laubscher Corporation, New York, N. Y.

MACHINERY—Chain Making
Baird Machine Company, Stratford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
Nilson, A. H. Machine Co., Shelton, Conn.
Pan American Supply Co., The, New York, N. Y.

MACHINERY—Closing Rope
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Behr Machinery & Equipment Corp., Rockford, Ill.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Herborn, Maschinenfabrik, Herborn, Germany
Morgardshammers Mek Verkstads A. B., Morgardshammer, Sweden.
National Mach'y Exch (Used), New York
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Pan American Supply Co., The, New York, N. Y.
Patterson Machine, Geo. C., Co., Cleveland, Ohio

MACHINERY—Dead Block (Stationary Coiler)
Morgan Construction Company, Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.
Herborn, Maschinenfabrik, Herborn, Germany
Wheelabrator Corporation, Mishawaka, Indiana

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Metallurgical Products Dept. of General Electric Co., Detroit
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

MACHINERY—Extruding
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Norton & Co., Ltd., Sir James, Manchester, England

MACHINERY—Flat Wire
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming Wire
Baird Machine Company, Stratford, Conn.
Nilson, A. H. Machine Co., Shelton, Conn.

MACHINERY—Galvanizing Wire
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Mfg. Co., Wallingford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Hydraulic
Porter, Inc., H. K., Somerville, Mass.

MACHINERY—Insulating Wire
American Insulating Mach'y Co., Phila., Pa.
Beard Machine Co., York, Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia
Cook Mfg. Co., The, Paterson, N. J.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg Co., Milwaukee, Wis.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N. Y.

MACHINERY—Packaging Wire
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Godderidge Ste., Houilles (Seine-et-Oise), France

MACHINERY—Plating
Hodge Bros. Machine Shop, Ossining, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Pointing
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York,
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Polishing Asbestos Wire
Beard Machine Co., York, Pa.

MACHINERY—Printing on Electric Wire
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., Boylston, Mass.

MACHINERY—Re-Spooling
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Colbourne Machine Company, Winsted, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Industrial Winding Machinery Co., New York, N. Y.
National Mach'y Exch. (Used), New York N. Y.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Rod Mill
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Royle, John & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Serving
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Pan American Supply Co., The, New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Staple
Baird Machine Company, Stratford, Conn.
Nilson, A. H. Machine Co., Shelton, Conn.
Pan American Supply Co., The, New York, N. Y.

MACHINERY—Straightening & Cutting
American Laubscher Corporation, New York 19, N. Y.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Pan American Supply Co., The, New York, N. Y.
Patterson Machine, Geo. C., Co., Cleveland, Ohio
Porter, Inc., H. K., Somerville, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Stranding
Godderidge Ste., Houilles, (Seine-et-Oise), France
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth & Bulmer Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
American Insulating Mach'y Co., Phila., Pa.
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Colbourne Machine Company, Winsted, Conn.
Collins Bros. Machine Co., Wire & Cable Machy. Div., Pawtucket, R. I.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Kraft, J. A., Maschinenfabrik, OLPE/Westf. Germany
Larmuth & Bulmer Limited, Manchester, England
Litzler, C. A., Co., Inc., Cleveland, Ohio
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Collins Bros. Machine Co., Wire & Cable Machy. Div., Pawtucket, R. I.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing Magnet Wire Coatings for Pin Holes
Federal Mfg. Co., Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Thread Rolling
Mettler Machine Tool, Inc., New Haven, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Godderidge Ste., Houilles (Seine-et-Oise), France
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—Welded Wire Mesh
National Electric Welding Machines Co., Bay City, Michigan
Schlatter, H. A., Ltd., Zurich, Switzerland

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot and Machinery—Welding Wire Fabrics)

MACHINERY—Winding Wire
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle, James L., Esmond, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Industrial Winding Machinery Co., New York, N. Y.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Laubscher Corporation, New York 19, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Federal Mfg. Co., Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Morgan Construction Co., Worcester, Mass.
Morgardshammers Mek Verkstads AB, Morgardshammer, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Norton & Co., Ltd., Sir James, Manchester, England
Pan American Supply Co., The, New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wartenweiler, Emilio, Milan, Italy
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Wire Forming
Baird Machine Company, Stratford, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Nilson, A. H. Machine Co., Shelton, Conn.
Pan American Supply Co., The, New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Larmuth (1947) Ltd., Swinton, England

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MOTORS—Electric, A.C. — D.C.
The Louis Allis Company, Milwaukee, Wisc.

NAIL TOOLING—Tungsten Carbide
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Brothers, Inc., Cortland, N. Y.

NIPPERS—Wire Cutting
Robinson, M. W. Co., Rockfall, Conn.

NOZZLES—For Extruding Machines
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

OVENS—Cable Lacquering and Enameling
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

OVENS—Rod Bakers
Carl Mayer Corp., The, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl Mayer Corp., The, Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio

PAILS—Packaging
(See Drums—Wire Packaging)

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAPER—Creped Wrapping
Ludlow Papers, Inc., Needham Heights, Mass.
National Waterproof Papers, Inc., Beverly, N. J.

PAPER—For Coil Wrapping and Corrosion Prevention
Ludlow Papers, Inc., Needham Heights, Mass.
National Waterproof Papers, Inc., Beverly, N. J.

PAPER—Insulating
Ludlow Papers, Inc., Needham Heights, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

PATENT—ATTORNEYS—
Rommel, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PLASTICIZERS—
Monsanto Chemical Company, Plastics Division, St. Louis, Mo.

PLASTICS COMPOUNDING—Custom
Plandex Corporation, Downingtown, Pa.

PLASTICS—for Wire Insulation
Blane Corporation, The, Canton, Mass.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plandex Corporation, Downingtown, Pa.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

PRINTING WHEELS—for Electric Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gillies, Duncan M. Co., Inc. Boylston, Mass.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

RACKS—Wire Storage
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Jarke Manufacturing Co., Chicago, Illinois

REEL AND TENSION STANDS—
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
National Vulcanized Fibre Co., Lestershire Spool Div., Wilmington, Del.
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Wilmington, Del.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Evans, George, Corp., Moline, Ill.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Wilmington, Del.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS—Steel, for Rope and Cable
Evans, George, Corp., Moline, Ill.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Boonton Molding Company, Boonton, N. J.
Bridge Mfg. Co., The, Hazardville, Conn.
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Wilmington, Del.
Nilson, A. H. Machine Co., Shelton, Conn.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Wood
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.

RODS—Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Niederrheinische Huette, A. G., Duisburg, Germany
Pittsburgh Steel Co., Pittsburgh, Pa.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

SATURATION SYSTEMS—
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SPOOLS—Plastic
Boonton Molding Company, Boonton, N. J.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
National Vulcanized Fibre Co., Lestershire Spool Div., Wilmington, Del.
Standard Mill Supply, Co., Pawtucket, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

STOCK STORAGE SYSTEMS
Jarke Manufacturing Co., Chicago, Illinois

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TABLES—Press Feeding
Jarke Manufacturing Co., Chicago, Illinois

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TESTERS—INSULATION
(See MACHINERY—Spark Testers)

TESTING EQUIPMENT
(See MACHINERY Testing, Physical and Diameter Testing)

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TOOLS—Wire Cutting
Porter, H. K., Inc., Somerville, Mass.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Adjustable Speed Drives)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Hodge Bros. Machine Shop, Ossining, N. Y.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

VARNISHES & LACQUERS—for Electric Wire
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
Shawinigan Resins Corporation, Springfield, Mass.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila, Pa.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

WELDERS—Spot and Butt and Welding Wire Fabrics
Eisler Engineering Corp., Newark, N. J.
Micro Products Co., Chicago, Ill.
National Electric Welding Machines Co., Bay City, Michigan
Schlatter, H. A., Ltd., Zurich, Switzerland

WHEELS—for Printing on Electric Wire
Gem Gravure Company, West Hanover, Mass.

WIRE—Aluminum
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Ball
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Barbed
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

WIRE—Brass and Bronze
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Cadmium
Stamford Processing Co., Peekskill, N. Y.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Clad and Plated
Sylvania Electric Products Inc., Warren, Pennsylvania

WIRE—Cold Heading
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.

WIRE—For Electrical Conductors
United Wire & Supply Corporation, Providence, R. I.

WIRE—Flat
Montgomery Co., The, Windsor Locks, Conn.
National Standard Company, Niles, Mich.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Galvanized
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
National Standard Company, Niles, Mich.
Roebling's, John A. Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—High Carbon
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Manufacturers
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corporation, Pressed Steel Div., Cleveland, Ohio
Roebling's, John A., Sons Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Metalizing
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WIRE—Music
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Worcester Wire Works Div., National-Standard Company, Worcester, Mass.

WIRE—Needle
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Alloy
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Malin & Co., The, Cleveland, Ohio
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Oil Tempered
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Special Shapes
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
Continental Steel Corp., Kokomo, Ind.
National Lock Washer Company, The, Newark, N. J.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Spring
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Roebling's John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Steel—Also Coppered and Galvanized Steel
American Chain & Cable, Page Steel and Wire Division, New York, N. Y.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WOOD—for Guide, Rolls, Bushings, Wear Parts, etc.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 16, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

WATSON

VERTICAL BUNCHERS TYPE "V"

U. S. PATENT 2,773,344

THE LEADING DESIGNS WITH AN INTERNATIONAL REPUTATION

NOTABLE ADVANTAGES:

1.—HIGHEST LONG-RUN OUTPUT ON LARGE STANDARD WIRE REELS.
2.—GREATEST COMPACTNESS. IDEAL FOR ROW GROUPING IN LIMITED SPACE.
3.—LABOR-SAVING. ONE OPERATOR CAN SERVE MANY MACHINES.
4.—QUICKEST PARTS SERVICE FROM CATALOGUED STOCK.
5.—LOWEST MACHINE COST DUE TO MASS MANUFACTURE.

SUITABLE FOR ALL COMMON BUNCHING WORK, AND USED ALSO FOR BUNCH-STRANDING AND CABLING OF STEEL AND ALUMINUM CLOTHESLINE, TELEVISION GUY WIRE, SEALING STRANDS, METAL FISH LINES, PAPER CORD, CONTINUOUS TWISTS OF FLAT WIRE, SMALL PLASTIC INSULATED CABLES, ANNUNCIATOR WIRES, PLASTIC CORDS, AND MANY OTHER PRODUCTS WHICH WOULD ORDINARILY REQUIRE THE USE OF MUCH MORE EXPENSIVE PROCESSING EQUIPMENT.

GENERAL SPECIFICATIONS

CONSTRUCTION: STEEL, HIGH STRENGTH ALLOYS AND BALL BEARING THROUGHOUT. MECHANISM HOUSED IN RIGID STEEL FRAME WITH SAFETY DOOR OPENING MACHINE SHUT-OFF.

NO INSTALLATION WORK REQUIRED.

STANDARD STEEL REELS: No. 7—16" x 8", 250 LB. CU. CAPACITY
No. 9—22" x 11", 650 LB. CU. CAPACITY
No. 10—24" x 14", 1000 LB. CU. CAPACITY

AVAILABLE LAYS: FROM 1/8" TO 4 7/8". RIGHT AND LEFT HAND TWIST. LAYS ARE FIXED AS SET. NO LAY WANDERING.

ELECTRICALS: MOTORS, CONTROLS AND LOW VOLTAGE ELECTRIC STOPS ARE BUILT IN AND WIRED FOR OPERATION.

STRAND SIZE RANGE: FROM FINE (7 x #34 B. & S.) TO 5/16" DIAMETER STRANDS.

WIRE FEED POINTS: FROM FRONT, REAR OR EITHER SIDE.

DELIVERIES: FROM STOCK.

SHIPMENTS: DOMESTIC—F.O.B. PATERSON, N. J.
FOREIGN—BOXED & DELIVERED TO NEW YORK HARBOR.

MACHINE BULLETINS AND PRICES UPON REQUEST

★ ★ ★

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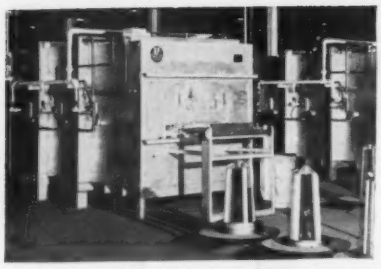
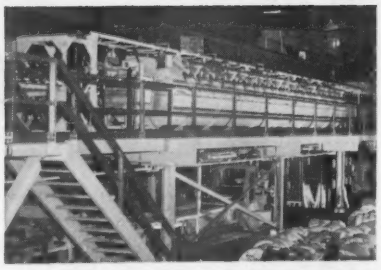
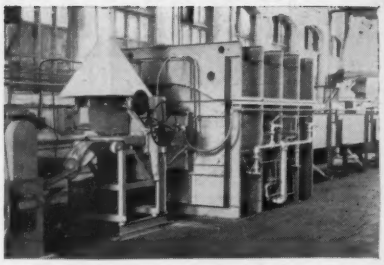


An EF multiple tube type furnace bright annealing stainless steel wire, continuously. One of an installation of five stainless steel furnaces we built in a prominent steel plant.

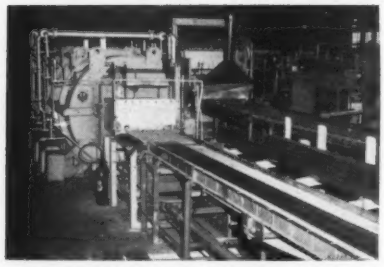


Large capacity EF gas fired furnace bright annealing stainless strip. We build them electrically heated or gas fired for wide or narrow strip, for single or multiple strands.

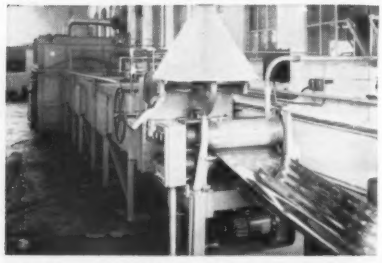


Stainless steel strip in various widths is bright annealed continuously in this EF gas fired special atmosphere installation equipped with an EF gas fired ammonia dissociator.

Bright Annealing Stainless



Stainless Steel Tubing in various diameters and lengths up to 24 feet is bright annealed continuously in this EF gas fired furnace.



Stainless Steel Strip. Wide, narrow and in various types, is uniformly bright annealed, continuously, in EF furnaces — any tonnage.

Tubing, Strip, Wire, Stampings and Other Stainless Steel Products

Stainless steel strip, wire, heavy and fine tubing, stampings, flatware, cooking ware, drawn and other stainless steel products, in many shapes and forms, are being bright annealed, uniformly, economically, continuously and with laboratory precision in EF furnaces of various sizes and types we have built.

Extensive experience with stainless steel problems, backed by over 40 years of practical furnace building experience and thousands of successful fuel fired and electric installations, enable EF engineers to design and build the best size and type of equipment needed for handling any product or production, or for any heat processing requirement.

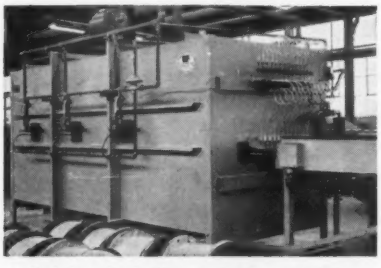
Submit your production furnace problems to experienced EF engineers — it pays.

THE ELECTRIC FURNACE CO.

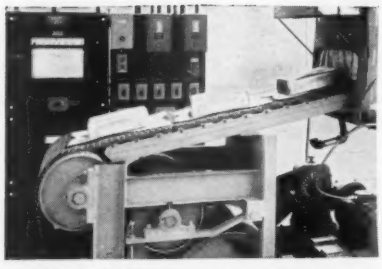
GAS FIRED OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio

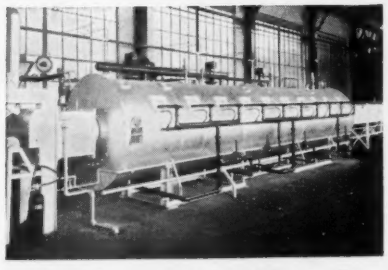
Canadian Associates • Canefco Limited • Toronto 1, Canada



Stainless Steel Wire is bright annealed in this and other EF continuous and batch type gas fired and electric furnaces we build.



Stainless Steel Stampings, flatware, drawn and other products; large, small and in various shapes are bright annealed in EF furnaces



Another type we build for bright annealing stainless strip. This EF furnace also handles other grades requiring lower temperatures.